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The influence of Parent Portal Access on Student Efficacy and Parental Involvement

Shannon D. Dries
shannon.dries@student.shu.edu

The Influence of Parent Portal Access on Student Efficacy and Parental Involvement

Shannon D. Dries

Dissertation Committee

Gerard Babo, Ed.D., Mentor
Barbara Strobert, Ed.D.
Michael Zarabi, Psy.D.

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DISSERTATION COMMITTEE
(please sign and date beside your name)

Mentor:
Dr. Gerard Babo 12/15/14

Committee Member:
Dr. Barbara Strobert Barbara Strobert 12/15/14

Committee Member:
Dr. Michael Zarabi 12/15/14

The mentor and any other committee members who wish to review revisions will sign and date this document only when revisions have been completed. Please return this form to the Office of Graduate Studies, where it will be placed in the candidate's file and submit a copy with your final dissertation to be bound as page number two.

Abstract

This study examined the influence of Parent Portal access on student achievement and parental involvement defined as home-to-school communication. The population was students in sixth grade in a suburban district in New Jersey. Academic achievement was defined through GPA at the end of sixth grade and performance on the New Jersey Assessment of Skills and Knowledge (NJ ASK) in both Math and Language Arts Literacy in Grade 6. Attendance was measured using attendance rates. Parental involvement was measured by the number of parent logins to Parent Portal. Multiple regression analyses, backward entry method, were used to determine the influence of Parent Portal access on both achievement and attendance. Chi square analysis was used to analyze the influence of Parent Portal access on both home-to-school communication and parent-to-student communication. The results of this study indicate that Parent Portal access has a statistically significant effect on achievement as defined by GPA but not on NJ ASK 6 scores or attendance. It was also determined that communication between parent and teacher as well as parent and student was influenced by access to and use of Parent Portal.

Key words: parental involvement, student achievement, and technology

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Dedication

This work is dedicated in loving memory to James and Catherine Dalton, my grandparents, who were the unwavering example that through hard work, perseverance, and kindness, all things are possible. As uneducated immigrants to this country, I know they would be proud to witness a small example of the culmination of their sacrifices and struggles that is this accomplishment.

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CHAPTER I

INTRODUCTION

Introduction

Parental involvement became an important topic in the field of education research beginning with the Coleman Report on Education in 1966. The idea that variables outside the school have an effect on test scores and student achievement was introduced in the report's findings. The United States Government supported these findings in 1983 with the publishing of *A Nation at Risk* by the National Commission on Excellence in Education and again in 2001 with the passing of the No Child Left Behind Act (NCLB). Both the report and NCLB mentioned the importance of parental involvement in improving academic success.

The electronic grade book (EGB) containing Parent Portal has been introduced into the educational marketplace as an addition to Student Information Systems (SIS). SIS allows districts to manage all student data, including demographics, state test scores, discipline records, free and reduced lunch status, medical records and attendance records. A recent feature, EGBs, allow teachers to manage their grade books electronically by entering data about assessment results onto a web-based format. Parents then log into a web-based application and access in real time their children's grades and attendance. School districts offer Student Information Systems (SIS) with Parent Portal features that provide parents and students full access to a teacher's grade book. Products like PowerSchool, Genesis, and Real Time have made pencils and green ledger books obsolete as a means of tracking student performance. Genesis and Realtime are available only to New Jersey schools and are products being used in roughly 50% of all New Jersey schools. PowerSchool by Pearson is the leader in the market and is utilized by districts throughout the country and internationally.

These electronic grade books can be the means through which communication between home and school can be improved. The push for increased parental involvement at all levels and specifically at the secondary level where there is a noted decline (Dornbach & Glasgow, 1999), is an effort to increase student achievement. There have been numerous studies in the area of parental involvement that espouse a link between parental involvement and student achievement (Shanahan & Walberg, 1985; Fan, 2001; Walberg, 1984; Fehrmann, Keith, & Reimers, 1987; Sanders, 2001). SISs have existed since the mid-eighties, but it is only in the past five to ten years that they have developed the ability to allow parent and student access to the information entered by district administrators and teachers.

Ultimately, while the debate about a concise definition of parental involvement, as well as the discussion about its true merits, continues to evolve, EGBs in effect increase school-to-home communication (Telem & Pinto, 2004; Hohlfeld et al., 2010; Blau & Hameiri, 2012).

Statement of the Problem

Since the Coleman report in 1966, parental involvement has been extolled as having an effect on academic achievement. Coleman was the first to look at the social factors that affect student achievement. His initial finding was as follows:

> The schools are remarkably similar in the way they relate to the achievement of their pupils when socioeconomic background of the students is taken into account . . . . When those factors are statistically controlled, however, it appears that differences between schools account for only a small fraction of differences in student achievement (Coleman et al., 1966, pp. 23-24).

Coleman (1966) also reported that about one-half to two-thirds of student achievement could be accounted for by family background variables rather than school variables. Coleman went on to

note that differences in family background such as socioeconomic status, level of education of parents, encyclopedias and newspapers in the home, have a greater impact on student achievement than differences in school characteristics such as textbooks, teacher training, curriculum, number of students in the class, and classroom environment. This sentiment was echoed by the National Commission on Excellence in Education in 1983 and then again by No Child Left Behind in 2001 when both outlined goals to increase student achievement through increased parental involvement. Fehrmann, Keith, and Reimers (1987) discovered that although the effect of parental involvement was small when compared to ability, involvement could be shaped and manipulated. Some researchers have proven that parental involvement does have a positive effect on student outcomes (Epstein, 1991; Fan & Chen, 2001).

Joyce Epstein (1995) set out to define parental involvement through her theoretical framework highlighting six separate types of involvement. This theory is based on prior research in the field as well as her own empirical research as noted in her 1998 Report No. 22 for Johns Hopkins University. She defines communicating as "communication with schools about programs and student progress through effective school-to-home and home-to-school communications" (Epstein et al., 2009, p.16). Her sample practices include conferences with every parent at least once a year, with follow-ups as needed; language translators to assist families as needed; weekly or monthly folders of student work sent home for review and comments; parent/student pickup of report card, with conferences on improving grades; regular schedule of useful notices, memos, phone calls, newsletters, and other communications. Schools should also provide clear information on choosing schools or courses, programs, and activities within schools as well as clear information on all school policies, programs, reforms, and transitions (Epstein et al., 2009).

According to some researchers (Dornbach & Glasgow, 1999; Spera, 2005; Pomerantz et al., 2007), due to the organizational structure of high schools, often parental involvement dwindles at this level. In an effort to increase the communication aspect of parental involvement, which, according to Longfellow (2008), is essential to student achievement, schools began utilizing Parent Portal piece of the Student Information System Software (SIS). This allows students and parents to access grades and attendance in real time. The introduction of these systems resulted in changes in the interrelations between parent and school. (Telem & Pinto, 2006; Hohlfeld, Ritzhaupt, & Barron, 2010).

While technology should be utilized in current society to meet students where they are, there is little research on the benefits of such technology. These programs are fairly new and constantly evolving. Electronic SISs have been in place since 1989 while the web-based programs were introduced in 1997 when PowerSchool installed its first program in a Salt Lake City middle school and expanded to 2,000 schools by the time it was purchased by Apple in 2001 (Pearson Acquires, 2006). The implementation of these programs to families differs based upon the district. Thus, while districts are spending large sums of money on these products, the overall question that begs to be asked is what effect, if any, does SIS have on student academic achievement? Additionally, do these programs actually increase and encourage parent/school communication and interaction? There is very little quantitative data on the use of EGBs and their possible influence on student achievement. Additionally, there is little quantitative research that studies the influence of EGBs on student achievement and school-to- home communication. The majority of the research on parental involvement is qualitative.

Purpose of the Study

Research has illustrated a link between parental involvement through school-to-home communication and student achievement as well as increased attendance and fewer discipline issues (Sheldon & Epstein, 2004; Spera, 2005). Sheldon and Epstein (2004) found that when initiatives included ten activities that represented the schools' efforts to directly connect with and involve family and community members in ways that support student attendance such as conducting workshops, making home visits, newsletters listing students with excellent attendance, and providing access to children's attendance on the Internet, there was an improvement in student attendance rates. Christopher Spera's (2005) literature review concluded that when parents monitor their children's after school activities, they facilitate their children's academic achievement and educational attainment.

The purpose of this study was to explore and analyze the nature of the relationship between parent/home-to-school communication through the use of electronic grade books and its possible influence on student achievement as measured by individual academic achievement and attendance. The researcher looked at the relationship between the use of electronic grade books and student GPA as well as NJ ASK scores.

This dissertation enhances and builds on the research conducted by Mark Mathern in 2009 entitled *The Relationship of Electronic Grade Book Access to Student Achievement, Student Attendance and Parent-Teacher Communication*. This study explored this relationship using different grade levels and a smaller sample size, while also utilizing a survey.

Hypothesis

There is much conflicting research in regard to parental involvement and its effect on student achievement. This is due in part to the varied definitions of parental involvement.

Having focused on home-to-school communication as a means of parental involvement, some of the research findings are as follows. Fan and Xiato (2001) found through their meta-analysis that home supervision has a very low relationship with student achievement. While Steinberg, Lamborn, Dornbusch, and Darling's study in 1987 did show a positive correlation between parental involvement and adolescent school achievement, it was the type of involvement that determined the strength of the correlation specifically authoritative (warm, firm, and democratic) parenting along with encouragement. Chen and Gregory (2010) studied the effects of parental involvement, specifically homework help at home, on ninth grade students. The researchers determined that the variables grade expectation and attainment expectation were the greatest predictors of student GPA. Fan and Chen (2001) asserted that their meta-analysis suggested a need for analysis of distinct types of parental involvement.

Ultimately, the results of this study can assist in providing a level of influence that parental involvement, specifically in the form of school-to-home communication through the use of Parent Portal in the EGB, has on student GPA and NJ ASK scores. Consequently, the null hypothesis is stated as follows: There is no significant association between the use of Parent Portal and student academic performance as measured by GPA and NJ ASK.

Research Questions

Overarching Research Question

What is the nature of the relationship between the use of Parent Portal as a proxy for parent home/school communication and student achievement in a suburban middle school?

Subsidiary Research Questions

What influence, if any, does access to and use of Parent Portal have on parent involvement as defined by home-to-school communication and parent-to-child communication?

Research Question 1. What evidence, if any, exists that suggests access to and the use of Parent Portal improves parent involvement as defined by the level of home-to-school communication?

Research Question 2. What evidence, if any, exists that suggests access to and the use of Parent Portal improves parent/student communication?

Research Question 3. What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by GPA when controlling for gender, attendance, free and reduced lunch status, and ethnicity?

Conceptual Framework

The discussion about parental involvement began in 1983 with the publishing of a report by the National Commission on Excellence in Education which touted the theory that increased parental involvement would improve student achievement (US Department of Education, 1986). This sentiment was echoed in the No Child Left Behind Act of 2001, which named parental involvement as one of the six-targeted areas for reform (U.S. Department of Education, 2007). Since then some studies have posited that parental involvement has an influence on secondary students' academic achievement, school attendance, and graduation and matriculation rates (Sanders, Epstein, & Connors-Tadros, 1999). However, according to some, parental involvement tends to decline at the secondary level (Pomerantz et al., 2007; Spera, 2005).

Joyce Epstein (2009) has completed extensive research in the area of parental involvement and outlined six types of involvement in *Handbook for Action*, including the following:

Parenting: Helping all families establish home environments to support children as students.

Communication: Designing effective forms of school-to-home and home-to-school communications about school programs and children's progress.

Volunteering: Recruiting and organizing parent help and support.

Learning at home: Providing information and ideas to families about how to help students at home with homework and other curriculum-related activities, decisions, and planning.

Decision-making: Including parents in school decisions, developing parent leaders and representatives.

Collaborating with the community: Identifying and integrating resources and services from the community to strengthen school programs, family practices, and student learning and development" (Epstein et al., 2009, p.16).

These six types of involvement are an extension of Epstein's theory of overlapping spheres of influence (1998), which include school, home, and family. There is a common theme throughout the six specific types of involvement and that is communication. Although communication is its own type, examples of communication in practice can be found in each of the five other types. In Type 1, parenting, some examples given by Epstein in her 2009 *Handbook for Action* include computerized phone messages on parenting for each grade level and other resources such as meetings and support programs for families. In Type 3, volunteering, examples in practice such as telephone trees provide families with needed information and annual postcard surveys to families. Type 4, learning at home, contains examples such as calendars for families about assignments and events in school. Both Types 5 and 6 decision

making and collaborating with the community also contain examples of communication such as networks to link families, active PTO/PTA groups, and information on community activities about health, cultural, recreational, and summer programs for students and families (Epstein et al., 2009).

Communication is what allows the overlapping spheres of influence—school, home, and community—to come together and, according to Epstein's theory, meet the needs of students (Epstein, 1998). Without meaningful communication between schools and families, it would be difficult to apply Epstein's theory into practice.

According to Longfellow (2008), communication between school and home is essential to student achievement. With technology dominating most aspects of life today, it is not uncommon for technology to be the main source of communication between school and home. Beginning in the late 1990s, school districts began using Student Information Systems to manage student data such as records, demographic information, attendance, and academic record keeping. These systems advanced over time and are now a source for home-to-school communication, as parents can log in with a secure password to access student grades and attendance (Electronic Education Report, 2006).

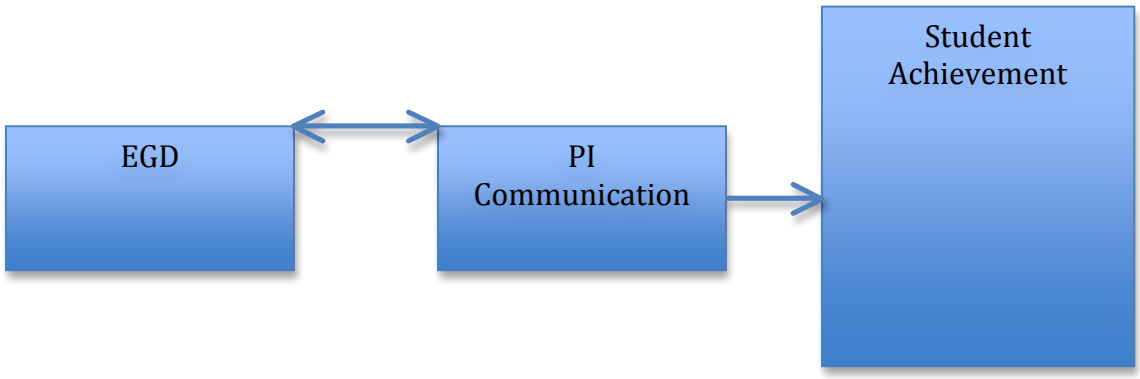

Figure 1. Conceptual framework.

Significance of the Study

In general, this study attempted to build upon the research regarding parental involvement and more specifically the influence of a web-based software interface on the level and/or quantity of that involvement. The focus specifically investigated school-to-home communication as measured through the use of EGBs and Parent Portal access. It will add to the limited body of quantitative research in the area of parental involvement and the use of Parent Portal.

Administrators will have a better understanding of the relationship between EGBs and parental involvement in schools, which is important, as there is a cost incurred by school districts in order to make them available to the public. Administrators, parents, and students will have a better understanding of the tool provided to them and the influence it may have on student achievement.

Design and Methodology

The author used a quantitative approach to determine if the level of use of EGBs might predict student achievement as measured by NJ ASK Math scores, NJ ASK Language Arts scores, and school GPA, while controlling for other demographic variables that influence student performance as established by the research. "Prediction, in its simplest sense is the process of estimating scores on one variable (y), the criterion variable, on the basis of knowledge of scores on another variable (x), the predictor variable." (Hinkle, Wiersma, & Jurs, 2003). In the case of this study the x variable, or predictor variable, is the level of use of EGBs. The y, or criterion variable, is the measured student outcome of the NJ ASK Math, NJ ASK Language Arts, and GPA.

Parent Portal usage data were collected at the culmination of the sample's sixth grade year, 2013. This particular grade level was chosen as these students participated in the NJ ASK in May of 2012 as fifth graders who did not have access to EGBs. The sample also participated in NJ ASK 6 in May of 2013 after having had access to EGBs throughout that school year.

The sample size utilized in this study is 218 students in the sixth grade enrolled in one of two middle schools located in the same town and district. These schools were sampled as a whole. The middle schools are located in northern New Jersey with a population of 18,000 which can be broken into the following ethnicities: 68.1% White, not Hispanic, 14.1% Hispanic, 2.9% Black, 13.1% Asian, and 2.7% multi-racial. This is a moderately diverse sample. As a result this study should have external validity for schools with a similar District Factor Group.

Quantitative data collected included NJ ASK 5 and 6 scores, attendance rates, GPA, and parent-access rates. These data were collected using data housed in PowerSchool, which is the district's Student Information System. Data were analyzed using multiple regression, backward-entry design. Qualitative data collected were in the form of a survey by parents with access to Parent Portal.

Limitations

The findings of this study were confined to one district in northern New Jersey of moderate size with a sample size of 218. This district is classified as GH on the District Factor Group scale.

For this particular sample, parent passwords are sent home in the mail to the parent; however, many parents share the password with the student. For this reason, the researcher cannot be sure that the parent was in fact the one logging into the system. One aspect of this study was to determine the effects, if any, of Parent Portal access rates and their influence on

school-to-home communication in order to make inferences concerning parental involvement. While the primary variable under study in this research project was parental involvement, it was limited to only one aspect of parental involvement, school-to-home communication through the use of Parent Portal access. Joyce Epstein (2009) defined six aspects of parental involvement; school-to-home communication falls under only one of those aspects and, as such, served as the primary variable under investigation in this study along with student achievement.

Delimitations

PowerSchool, a Pearson product, was the only SIS utilized throughout the study. Administration, teachers, parents, and students use PowerSchool. The administration uses the system to maintain student records and files, to create the master schedule, and to map student attendance. Teachers use the system to record attendance and grades. Parents and students are provided secure login information to access their grades and attendance and also to choose courses for the next year. There are other SIS products with Parent Portal functions such as Genesis and Realtime. Genesis is the leader in web-based student record data for New Jersey schools. Over 200 school districts rely on Genesis' Student Information System to manage their student records. Realtime's Student Information System is a secure, browser-based, comprehensive, single source solution for all district and school administrative needs. As only one SIS, Parent Portal, was studied, the results are limited to that product.

Definition of Terms

Electronic Grade Book (EGB): Student information system offered by Pearson's PowerSchool student information system.

Parent Portal (PP): Parent login system provided by Pearson. Each parent is provided with a secure login to access his or her child's grades and attendance through an Internet

application. Teachers enter information related to student grades and assignments. Student attendance is also accessible.

Student Information System (SIS): A software application for education establishments to manage student data.

Grade Book Access Rate (GBAR): The rate at which Parent Portal was accessed by each parent for his or her child.

Parental Involvement (PI): For the purpose of this study parental involvement is defined as school-to-home communication through the use of an electronic grade book (EGB).

Grade Point Average (GPA): As determined through calculating the average of a student's marking period and final exam grade while factoring in quality points for honors and AP classes.

The New Jersey Assessment of Skills and Knowledge (NJ ASK) was implemented in 2003 to Grades 3-8 in response to No Child Left Behind. The exam is administered over four days for Grades 3, 5, 6, 7 and five days for Grades 4 and 8 simultaneously throughout the state and contains math, reading, writing, and science sections (Science is for Grades 4 and 8 only). The goal is to measure and promote student achievement of challenging state curriculum standards, provide accurate and meaningful information about student performance, and meet state and federal accountability requirement

NJ ASK Language Arts Literacy: On April 30-May 1, 2013, students in fifth and sixth grades took the Language Arts Literacy section which contained questions for reading and writing. Students were provided three to four reading passages per grade level from literature and formal "everyday" reading selections. Students were provided with various prompts and were asked to respond in a variety of forms such as expository, persuasive,

and narrative. These prompts were labeled speculative, explanatory, expository, or persuasive.

NJ ASK Math: On May 2 and 3, 2013, students in Grades 4 and 5 took the Mathematics section of the test. Students answered multiple choice, short constructed-response, and extended constructed-response questions. Questions were based upon the Common Core Standards in each appropriate grade level.

Summary of Chapter 1 and Organization of the Study

Chapter I included a brief overview of the historical reference of parental involvement in education as well as the introduction of the use of electronic grade books. Other topics were introduced including both the purpose of the study and the researcher's hypothesis. Also included in chapter one is an introduction to the questions guiding the research, the conceptual framework, and the significance of the study. Design and methodology were presented along with the study's limitations and delimitations. Chapter I concluded with the definition of terms relevant to the study.

Chapter II provides a review of the research and literature related to parent involvement, School-to-home communication, and technology in education. Chapter III provides an explanation of the design and methodology for the research, specifically the mixed-methods approach. Population, sampling, and data collection are included. Chapter IV provides a detailed analysis of the data and results from the study. Chapter V contains a summary and discussion of the results as well as interpretations of the data relative to the recommendations for practice.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Is there a relationship between Parent Portal access and student achievement? In order to position this study within the current literature, empirical studies on the subject of parental involvement, technology, and communication were examined. Student variables were also examined through empirical studies.

This chapter introduces the literature search process, the methodological issues in the studies examined, inclusion criteria for the studies, and the theoretical framework, as well as the review of literature topics.

Purpose of the Study

Research has illustrated a link between parental involvement through school-to-home communication and student achievement as well as increased attendance and fewer discipline issues. (Sheldon & Epstein, 2004; Spera, 2005). Sheldon and Epstein (2004) found that when initiatives included ten activities that represented the schools' efforts to directly connect with and involve family and community members in ways that support student attendance such as conducting workshops, making home visits, newsletters listing students with excellent attendance, and providing access to children's attendance on the internet, there was an improvement in student attendance rates. Christopher Spera's (2005) literature review concluded that when parents monitor their children's after school activities, they facilitate their children's academic achievement and educational attainment.

The purpose of this study was to explore and analyze the nature of the relationship between parent/home-to-school communication through the use of electronic grade books and its

possible influence on student achievement as measured by individual academic achievement and attendance. The researcher examined the relationship between the use of electronic grade books and student GPA as well as NJ ASK scores.

This dissertation will enhance and build on the research conducted by Mark Mathern in 2009 entitled *The Relationship of Electronic Grade Book Access to Student Achievement, Student Attendance and Parent-Teacher Communication*. This study explored this relationship using different grade levels and a smaller sample size, while also utilizing survey data collection.

The history of parental involvement has a sociological and political context. From this idea morphed the notion that the home environment and not necessarily the SES of the family could positively affect student achievement. This sentiment is echoed today by numerous researchers (Fan, 2001; Keith& Keith, 1993; Shanahan & Walberg, 1985; Fan & Chen, 2001) who extol the importance of parental involvement in student achievement. The National Commission on Excellence in Education in 1983 listed parental involvement as a significant goal and target for educational reform. In 2001, No Child Left Behind mirrored this notion, as it listed parental involvement as one of its six targeted areas for reform (U.S. Department of Education, 2001).

In 2006 the U.S. Department of Education published a report with statistics involving parental involvement. Parents in the United States most commonly become involved on the school front through their presence at general school meetings and parent-teacher conferences, which national surveys indicate are attended by approximately two thirds of parents regardless of their ethnicity (U.S. Department of Education, 2006).

Chen and Fan (2001) found that home environment accounts for 10% of the variance of student achievement. According to Finn (1998) parents' ability to be involved with homework,

to discuss school matters, to read with children at home, and to help children manage their time are all ways that parents can engage their children at home. Parental involvement in students' academic and social lives is one variable that would seem likely to have important potential for promoting student academic achievement (Walberg, 1984).

Fehrmann, Keith, and Reimers (1987) discovered through their study that although the effect of parental involvement was small as compared to ability, involvement could be shaped and manipulated, unlike ability. In the same vein, although SES cannot be changed, parents' behavior can be shaped, which can then help their children achieve higher grades. While parental involvement is instinctually appealing, it is not always supported by the research. Unfortunately, the research results on the topic are inconsistent. The overwhelming majority of the research is qualitative and non-experimental and relies heavily on student, parent, and teacher reports. Path analyses and correlations are often drawn; but depending upon the researcher, the results differ greatly. There had been issues with the definition of parental involvement and lack of theoretical framework until Joyce L. Epstein created the six types of involvement in an effort to standardize the definition.

There are many researchers who have established that parental involvement has a positive effect on student outcomes (Epstein, 1991; Fan & Chen, 2001). These studies have largely focused on elementary aged students. Others have found that there is little or no effect of parental involvement on achievement. One study measured the effect of parental involvement on standardized achievement tests for high school seniors. In this case parental involvement was measured by student reports of the degree to which their parents influenced their post high school plans and monitored their daily activities and school progress (Keith et al., 1986). In 1991, Keith concluded that the effects of parental involvement might vary with (a) age of the

students, (b) the definition of parental involvement, and (c) the definition of learning used. Another study found that parents' educational aspirations for their children stood out as having a consistent effect on students' academic growth over and above that of SES. However, communication and volunteer activities had less consistent and less obvious effects, while parental contact with school had negative effects (Fan, 2001).

Although there is a vast body of research on parental involvement, there are few empirically based studies. When Fan and Chen (2011) conducted their meta-analysis in 2001, they found over 2,000 articles related to parental involvement from both educational and psychological backgrounds. Only 25 studies met their inclusion criteria, which included the use of Pearson correlations between any of the parental involvement indicators and any of the achievement outcome variables.

One of the major reasons for these inconsistencies in the research was the lack of a salient definition of parental involvement. Another reason is that the age of the population varies from elementary school to high school with most research being conducted at the elementary school level. Government policy for all schools is not based upon research conducted at all levels. Ultimately, there is a great need for further, empirical research with a consistent framework.

Definitions of Parental Involvement

The definition of parental involvement is wide ranging. Joyce Epstein defined six types of parental involvement in 1995 and created a handbook for use in school districts to improve school, family, and community partnerships.

Parenting: Helping all families establish home environments to support children as students

Communication: Designing effective forms of school-to-home and home-to-school communications about school programs and children's progress

Volunteering: Recruiting and organizing parent help and support

Learning at home: Providing information and ideas to families about how to help students at home with homework and other curriculum-related activities, decisions, and planning

Decision-making: Including parents in school decisions, developing parent leaders and representatives

Collaborating with the community: Identifying and integrating resources and services from the community to strengthen school programs, family practices, and student learning and development (Epstein et al., 2009, p. 16).

Parental involvement has been defined as a parent's involvement in school activities, while others have defined it as parental interest in the student's social and academic life (Keith et al., 1986; Pomerantz et al., 2007). It can also be defined as communication between the home and school (Walberg, 1986). Denessen et al. (2007) uses both school-to-home communication and parental involvement in the school as definitions for his qualitative study. Finn (1998) defines parental involvement using three areas of interest: actively organizing and monitoring the child's time, helping with homework, and discussing school matters with the child. Finn's definition revolves solely around the parent and the child's communication and does not take into account involvement in the actual school through either school-to-home communication or presence in the school.

Parental involvement is also defined as school involvement or the parent's participation in activities at school and at home as a combined definition. Cognitive-intellectual involvement refers to parents' coordinating and participating in educational activities with their child.

Personal involvement includes a parent's awareness of what is going on with his or her child at school (Grolnick & Slowiaczek, 1994). While this is a comprehensive definition, some are simpler. Twilly and Legum (2007) use membership and attendance at PTA meetings to measure parental involvement in their study. Another seemingly simple definition was used by Dornbusch and Ritter (1988), who conducted a study to determine parental involvement on high school student achievement. They measured parental involvement through parents' attendance at school functions.

Some researchers break down the definition of parental involvement even further, focusing on parenting habits. Christopher Spera (2005) delineates between parental practices and parenting styles as first defined by Darling and Steinberg (1993). Parenting practices are defined as specific behaviors that parents use to socialize their children; for example, socializing children to succeed in school through help with homework and reading with their children. Parenting style is the emotional climate in which parents raise their children, often characterized by a parent's responsiveness or demandingness.

Some researchers use a multi-dimensional approach, combining Epstein's typology of the six areas of involvement with a more psychosocial approach as discussed by Darling and Sandberg. Chen and Gregory (2010) define parental involvement as direct participation through helping with homework and volunteering, encouragement of success through reinforcement, and socialization of values such as having high expectations for educational achievement and attainment.

Many researchers are breaking down parental involvement even further by defining practices in the home. Some researchers (Fehrmann et al., 1987; Chen & Fan, 2001) discuss the benefits of parents supervising homework and other activities at home. Chen and Fan (2001)

found that parental supervision had the lowest correlation to achievement although the researchers explain that often, tightened supervision happens in homes where students are not succeeding academically. Pomerantz and associates found that the more controlling the mother's behaviors were, the less prepared the children were for school. From the adolescent perspective, when parents focused more on effort than ability and the process of learning at home as opposed to achievement, this enhanced skill and motivational development (2007).

The definitions of parental involvement are numerous and cover everything from school- to-home communication, parenting styles, learning in the home, parental expectations, and parents' involvement in school activities. The numerous definitions offer questions about continuity of research results when so many definitions are employed. Researchers (Fan & Chen, 2001; Spera, 2005; Sanders, 2001; Simon, 2004) refer to Epstein's six-part comprehensive definition of parental involvement and overlapping spheres of influence (OSI). This is a step in the right direction.

Literature Search Process

I employed the use of electronic databases, books, and the Internet when conducting my search. The databases included EBSCO Host, ERIC, Academic Search Premier, Google Scholar and JStor. I also searched the online publication database on the U.S. Department of Education website. I researched literature reviews and dissertations related to my topic. I searched empirical studies that included quantitative, qualitative, mixed-methods, and meta-analyses. I also utilized Inter Library Loan to procure some of my research. My search terms included the following:

Parental Involvement

Parental Involvement and Secondary Education

Prenatal Involvement and High School

Parental Involvement and Student Achievement

Parental Involvement and School-to-Home Communication

Parental Involvement and Quantitative Studies

Parental Involvement and Qualitative Studies

School-to-Home Communication

Technology and Academic Achievement

Technology in Education

Technology and Communication

Technology and Student Achievement

Technology and School-to-Home Communication

Socioeconomic Status and Student Achievement

Gender and Student Achievement

Prior Performance and Academic Achievement

Student Information Systems

Pearson

Genesis

Electronic Grade Books

PowerSchool

NCLB and Parental Involvement

Methodological Issues in Studies

There were numerous methodological issues in the studies I reviewed throughout this process. The most glaring concern was the lack of quantitative research on the topic of parental

involvement. In all of my research I also have yet to come across any experimental studies available in this area. The majority of the research is qualitative, which relies heavily on student, parent, and teacher perception and report. Also, the majority of the research is on elementary aged children when there is a need for studies at the secondary level as suggested by the fact that parental involvement seems to decline in the high school years (Dornbach & Glasgow, 1999; Pomerantz et al., 2007; Spera, 2005).

There is also an issue with the ability to define parental involvement. It seems that each study defines parental involvement using different terms and meanings under the following groupings:

- Communication
- Parental expectations
- Home structure
- Presence in school
- Community partnerships
- Learning at home

The lack of quantitative research at any level, the lack of research at the secondary level, and the lack of a theoretical framework until Epstein's work in the late nineties, cause numerous issues in the existing literature. The inability of researchers to follow one construct or definition is also problematic.

Inclusion Criteria for Literature Review

Studies that met the following criteria were included in the review:

- Studies used: non experimental, quasi-experimental with control groups, meta-analysis or path analysis

- Peer-reviewed journals, dissertations, literature reviews, and books
- Reported statistical significance
- Used ANOVA, factor analysis, correlation and regression analysis
- Empirical studies conducted and published over the last 25 years
- Older seminal works that are pre-experimental and experimental and discuss the history, background, and emergence of parental involvement in education
- Any literature that meets the above design criteria
- Studies were included that examined parental involvement
- Studies were included that examined parental involvement as it relates to achievement
- Studies were included that examined parental involvement from the perspective of the student
- Studies were included that examined parental involvement from the perspective of the parent, student, and teacher
- Studies were included that examined the use of technology in education
- Studies were excluded that did not report any statistical significance
- The study designs researched: non-experimental with control groups and meta-analysis which pertained exclusively to parental involvement (i.e., parents, students, and teacher), and schools.
- I included the historical background on the emergence of parental involvement theory, parent behaviors, student behaviors, technology, and empirical research
- Some research in popular media was utilized to place the use of technology, specifically SISs, in a historical context.

Theoretical Framework

Throughout the research on parental involvement, a glaring inconsistency was the lack of a theoretical framework in place. This led to numerous definitions being employed by researchers, which then led to varying results of empirical studies. In the early 1990s, Joyce L. Epstein created four types of parental involvement to which she later added two additional definitions. This six-definition framework seems to be the most comprehensive framework in a sea of definitions and ideas about parental involvement. In 1995 Epstein improved upon her six types of parental involvement and wrote about overlapping spheres of influence: the school, the family, and the community.

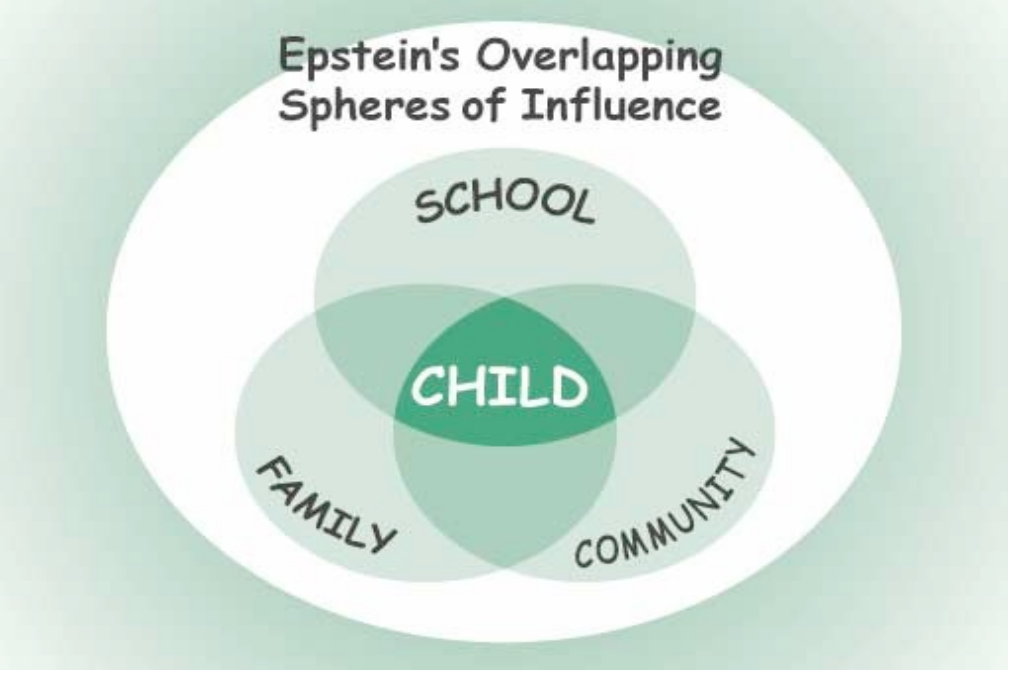

Figure 2. Epstein's overlapping spheres of influence.

Source: Google Images Joyce L. Epstein
(http://www.naperville203.org/parents-students/epsteinmodelps.as)

The external model of overlapping spheres of influence recognizes that the three major contexts in which students learn and grow—the family, the school, the community—may be brought together or pushed apart. At the center of the model is always the student. In order for the framework to be employed successfully, all three components must meet in conjunction to benefit the student. This may occur on a school-wide basis as in the example of a back to school night, on an individual basis as in a parent-teacher conference, at the community level with the use of community groups like a PTA, or partnerships like school-to-work programs (Epstein, 1995).

Epstein's framework has allowed there to be consistency in defining parental involvement and also has allowed schools to create comprehensive programs for school, home, and community partnerships. EGB access has added to these programs and opened the door for more two-way communication to take place between the home and the school. EGB access allows for timely information to be shared with parents and students in regard to performance and attendance.

Using Epstein's notion of six main types of involvement can make empirical studies difficult. To that end, the focus has been mainly on school-to-home communication. With advancing technology, that communication has moved to the forefront of parental involvement. Also, due to the inconsistencies in the findings in regard to the type of parental involvement, this study focused primarily on communication, as that seems to consistently show influence on student achievement.student ssssstudent achievement.

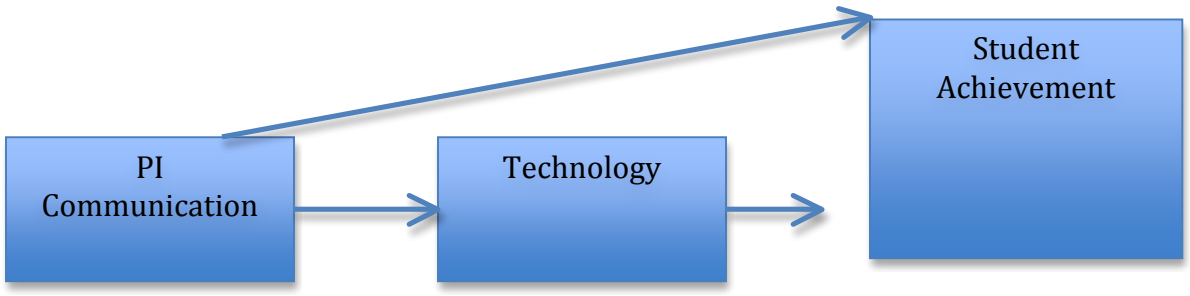

Figure 3. Conceptual framework.

Technology has afforded Epstein's (1995) overlapping spheres of influence (OSI) to become a reality in schools. Beginning with the use of voicemail and email technology, EGB has been the next medium for productive and timely two-way communication. The partnership between home, school, and community has been strengthened through the use of technology and specifically the EGB. In order for the OSI to have an influence on student achievement, there must be two-way communication and not merely information being delivered from the school to the home and community.

Review of Literature Topics

Parental Involvement and Achievement

Parental involvement has long been studied and analyzed at the elementary, middle, and high school levels. At the federal level, the No Child Left Behind Act of 2001 named increasing parental involvement as one of the six areas targeted for reform. According to the U.S. Department of Education's definition, parental involvement occurs when parents and educators participate in "regular two-way and meaningful communication involving student academic learning and other school activities" (U.S. Department of Education, 2007). Family involvement practices at home have been found to influence secondary students' academic achievement,

school attendance, and graduation and matriculation rates (Sanders, Epstein, & Connors-Tadros, 1999; Sheldon & Epstein, 2004; Telem & Pinto, 2002). Popular press and policy makers have dovetailed off the recent suggestions by the U.S. Department of Education; parental involvement is the latest panacea to improve school learning (Keith & Keith, 1993).

The conversation about parental involvement and its effect on student achievement began long before NCLB of 2001. In 1966 The Coleman Report was published by the U.S. Department of Education, reporting on the state of educational equality in the United States. The report noted the importance of the home environment on student success (Coleman et al., 1966). In 1983 *A Nation at Risk* was published by the National Commission on Excellence in Education, which expressed concern about the failing nature of our country's schools. One of the theories implemented to cure the ills of public education was parental involvement. It was hoped that parental involvement in students' academic lives would likely have an effect on student achievement (Bloom, 1984, U.S. Department of Education, 1986).

In an effort to improve the sometimes-dwindling levels of parental involvement at the secondary level due to the organizational structure of high schools (Dornbach & Glasgow, 1999; Pomerantz et al., 2007; Spera, 2005), one solution was the implementation of Student Information Systems in many schools in the state of New Jersey. Through these SISs, parents can log in and extract pertinent data about a student's grades and attendance from any device with Internet capabilities. Has the increase in school-to-home communication through the use of electronic grade books had any effect on student achievement?

Empirical Studies

Xitao Fan conducted a study in 2001 with four research objectives: (a) to assess the dimensions of parental involvement empirically, (b) to examine any potential differences in the

degree of parental involvement among four ethnic groups, (c) to examine the effect of parental involvement on students' academic growth, and (d) to assess whether the effect of parental involvement on students' academic growth or lack thereof is consistent across the data sources (student versus parent data) and across ethnic groups. In order to determine if parental involvement has any effect on student outcomes, the author used subject-specific grades for a more specific outcome.

The study was mixed methods and non-experimental in nature, which utilized NELS:88 data over the course of four years or three waves of data beginning in eighth grade and ending two years after graduation.

The design of the study included analyzing NELS:88 data using several analytic approaches. To assess the dimensions of parental involvement, the author used exploratory factor analysis, which separated out parent data from student data. MANCOVA was used to examine potential ethnic group differences in parental involvement. Fan used latent growth curve analysis within the framework of structural equation modeling to assess the effect of parental involvement on students' academic growth. "In order to best utilize structural equation modeling, the author implemented both the latent growth model without predictors (unconditional model) and the latent growth model with predictors (conditional model)" (Fan, 2001, p. 36).

There were considerable performance differences among the four ethnic groups in the four academic areas. The data from the first wave (1988) show an effect size of .85, which would be considered large. After adjusting for SES differences among the groups, the performance differences become smaller.

It is reported through the results that reported degrees of parental involvement were comparable once SES was controlled. The researchers discovered that parents' education

aspirations for their children had consistent effect on student academic growth, while communication and volunteer activities had less consistent effect on student achievement. They also found that parent contact with school had negative effects on student achievement. This, however, could be explained by the nature of student academic standing and the parents who contact the school. It is suggested that parents with students who have lower academic standings have a higher rate of contacting the school.

Although parental involvement is often touted as a means to improve academic achievement, it seems that all parental involvement is not equal and does not always result in greater academic success. What is important is to operationally define parental involvement as based upon this study; the numerous definitions of involvement have different effects on student achievement. Fan's study proves that parental involvement has an impact on student achievement that overcomes SES, but only in the arena of parental expectation for students' future aspirations. Conversely, the researcher found that parental contact with the school has a negative impact on student achievement. These findings might also have something to do with the fact that often the parents who have the most contact with school do so because there is already an issue either academic or discipline related. Also, parents' presence in the school had inconsistent effects. The research on this topic is largely inconsistent but it is even so within the confines of this one study.

Paul G. Fehrmann, Timothy Z. Keith, and Thomas M. Reimers conducted a qualitative study on the effect of parental involvement on high school students' grades in 1987. The sample size consisted of 28,051 high school seniors selected from the first wave (1980) of the National Center for Education Statistics' High School and Beyond Longitudinal Study (HSB).

This was a non-experimental, qualitative study. Path analysis was used to determine the direct and indirect influences of parental involvement, homework, and TV time on high school seniors' grades. The model analyzed the four main variables as well as background variables such as ability, ethnicity, family background, and gender and their direct and indirect effect on student grades.

The path from parental involvement to homework suggests that parental involvement has a meaningful and direct effect on time spent doing homework. The path from parental involvement to TV time showed a negligible effect. The indirect effects for parental involvement on grades through TV time and for parental involvement on grades through time spent on homework were not found to be meaningful. The total effect of parental involvement on grades shows a meaningful, direct effect. Also meaningful is the effect of homework time on grades.

The results suggest that parental involvement does have an important direct effect on grades, although contrary to expectations, its indirect effect on grades through homework and TV time is negligible. Although the effect of parental involvement on grades might seem small in comparison to ability, its effect was meaningful and positive. The very interesting piece of this study is that although parental involvement is important to student grades, which kind of involvement is effective? The researchers attempt to define parental involvement through path analysis and variables such as TV time and homework. However, the path through homework showed negligible results in terms of student grades. Thus, what type of parental involvement is affecting student grades? This is yet another example where the findings seem inconsistent.

Xitao Fan and Michael Chen (2001) conducted a meta-analysis to determine the existence of a relationship between parental involvement and student achievement as well as the

strength of that relationship. What are some of the potential study features that have moderating effects on the relationship between parental involvement and students' academic achievement?

The researchers conducted a quantitative, non-experimental study, which focused on the relationship between parental involvement and students' academic achievement. After conducting a search for relevant studies, they narrowed 2,000 studies to just 25, based upon their ability to report empirical findings and those from which Pearson correlations between any of the parental involvement indicators and any of the achievement outcomes could be obtained.

Two types of meta-analyses were conducted. The first included all correlational coefficients and ignored the fact that some studies had multiple effect-size measures. The second was a study effects meta-analysis in which by averaging multiple effect-size measures within one study, each study contributes only one effect-size measure to the analysis. Age and ethnicity showed relatively small, although statistically significant, effect on the relationship between parental involvement and students' academic success. The overall medium effect size of r =.25 suggests that parental involvement does have a positive influence on students' academic achievement.

This study found that although there is a correlation between parental involvement and students' academic achievement, it found that within certain dimensions of that variable there were differences in the strength of the correlation. Home supervision has a very low relationship with students' academic achievement, while parents' aspiration/expectation for their children's educational achievement has the strongest relationship with students' academic achievement. This study reflected what was previously found in Xiato Fan's 2001 study. Home supervision had a very low relationship with student achievement, while Fan (2001) found that it had a negligible effect. Although parental involvement is often touted to improve academic success, it

seems that not all types or definitions of involvement elicit benefits where academic achievement is concerned.

Timothy Z. Keith and Patricia B. Keith conducted a latent variable structural analysis on the effect of parental involvement on eighth-grade student achievement in 1993. Keith and Keith (1993) used a non-experimental, qualitative design and instead opted for path analysis using the data set from NELS:88 and included data from 21,814 eighth grade students. Background variables such as ethnicity, family background characteristics, and previous achievement were controlled.

Parental involvement was measured through common definitions and was drawn from both parent and student reports that included the following: educational aspirations (Aspire), parent-child communication (Talk), amount of home structure (Structure) and participation in school activities (Participate).

The results are as follows: The strongest influence on achievement was previous achievement. The path from general parental involvement to achievement was the second largest influence on achievement. Some other interesting results include that the path from previous achievement to parental involvement suggests that parents are more involved when their children perform well in school. Parental involvement had a very strong effect on time spent on homework. Only homework had a meaningful effect on achievement and time spent watching television was insignificant and deleted from the model.

While it would seem that parental involvement influences achievement, the research shows that previous academic success has the largest influence on not only eighth grade achievement but also on the amount of parental involvement. Which came first? The achievement? The involvement?

Communication

Researchers have noted that schools' practices to inform and involve parents influenced parental involvement more than parent education, family size, marital status, and grade level (Dauber & Epstein, 1993). Simon (2004) found that school contacts to parents about college-planning workshops best predicted attendance at those meetings. School contact to parents about helping teenagers with homework most strongly predicted parents working with students on homework. Similarly, school contacts about volunteering, teenagers' course selection, and teenagers' plans after high school most strongly predicted parent-teenager college planning discussions.

Hohlfeld, Ritzhaupt, and Barron (2010) found through their study on the use of information communication technology that its use in schools in Florida increased the diversity of communication methods employed within districts. The use of information communication technology on the whole increases the modes through which open communication takes place between schools and families.

Empirical Studies

In 2004 Beth S. Simon conducted a study on how parents' reports of high schools' outreach predicted parents' participation in various parenting, volunteering, and learning at home activities, using data from the National Education Longitudinal Study of 1988, using a subset of 11,348 parents. This study was non-experimental and qualitative and utilized Joyce Epstein's (2004) framework of overlapping spheres of influence.

The dependent variables included parenting, volunteering, and learning at home, The independent variables were measured on the same scales, coded as the dependent variables were coded, and included high school outreach, or how often the school contacted the parent.

The researcher controlled for socioeconomic status, gender, family composition, race/ethnicity, and composite of reading/math standardized test scores in Grade 12.

High school outreach positively influenced parents' attendance at college planning workshops if various methods were employed. The strongest predictors were the school outreach measures linked to parents' college planning workshop attendance. The more often parents reported outreach from the school about course selection and plans after high school, the more likely they reported attending a workshop. Regardless of student achievement, SES, gender, family structure, and race/ethnicity, these school contacts were positively associated with parents' attendance at college planning meetings. Student background and achievement explained 7% of the variance; but when schools' outreach was added to student background and achievement variables, 16% of the variance was explained.

High school outreach about teenagers' post secondary plans positively predicted parent-teenager college planning and employment discussions. The model that controlled for background and achievement explained only 11% of the variance. When school outreach was added to the model, it explained 12% of the variance of parents talking to teenagers about postsecondary plans. School outreach positively predicted how often parents discussed postsecondary plans with teenagers. Student background and achievement explained 2% of the variance, which was not changed when school outreach was added to the model.

Volunteering

School contacts about volunteering and fundraising opportunities at the school most strongly and positively predicted parents' attendance at school activities. The model that included student background and achievement controls explained 5% of the variance in parents'

attendance at school activities with teenagers; but when school outreach was added to the model, 14% of the variance was explained.

Learning at Home

In general, after controlling for student background and achievement, school outreach variables only modestly predicted parents' awareness of teenagers' academic progress. The addition of each school outreach variable to models with just background and achievement variables did not increase the explanatory power greater than 6%.

School outreach to parents about how to help teenagers with homework positively and significantly predicted how often parents worked with their teenagers. The model explained 5% of the variance in parents' working with their teenagers, while only 4% of school contacts about teenagers' attendance and behavior were either negatively associated with parents' involvement or had no significant association.

The results showed that there was a positive correlation between school outreach and parental involvement in all cases, barring school outreach about behavior and attendance. The variable of school outreach strengthened the control variable of background and student achievement, proving that school-to-home communication is important to parental involvement.

Tina N. Hilfield, Albert D. Ritzhaupt, and Ann E. Barron published a quantitative, non-experimental study in 2010 to determine if the use of Information Communication Technology (ICT) increases communication between schools, families, and the community. Data were collected over a four-year period to answer research questions regarding communication in Florida's K-12 schools. Has the ICT increased communication with community members and parents at all levels? Have schools increased the number of community members who contribute to technology planning at all levels and at high and low SES schools? Are schools equally

committed to sharing technological resources at all school levels and at high and low SES schools? Data were collected from online databases through the Florida Department of Education and the sample included all schools—elementary, middle and high school—that participated in the survey for all four years (2003-2007).

The increased use of technology tools was significant throughout the four years. High schools used more technology tools for communication than other levels. The most involved stakeholders were parents, community members, and parents. At the high school level, students were the most involved in the use of technology tools. In regard to supporting the acquisition of technology skills for parents and community members, less than 30% of schools provide community training.

This research shows that the percentage of schools using technology at all grade levels and SES levels is increasing significantly. This research did not comment on the quality of these communications or their content; it simply investigated the modes of communication. It is important to further investigate the types of technology being used for school-to-home communication and their contribution to parental involvement.

Technology

Communication between school and home is essential to student achievement (Longfellow, 2008). Schools started down the path of technology to improve home-to-school communication with voicemail systems in the 90s that, according to Cameron and Lee (1997), were advantageous, as they required little time, afforded immediate feedback, and allowed for communication to occur in familiar surroundings. Now technology is employed on a daily basis in most school systems. Voicemail is commonplace, schools and even individual teachers have web pages where they can post assignments, classroom news, and notes. Each teacher is

provided with an email address to ease the use of school-to-home communication with parents who work and even with students. Most recently, schools have implemented Student Information Systems (SIS) that provide parents access to student grades and attendance from any Internet-capable device. Call chains are a thing of the past with schools and municipalities employing the use of Alert Now systems and Reverse 911 to notify families of school closings, hazardous conditions in the town, and even school/town events and happenings. These are done through emails, calls, and texts, and often all three. According to Nichani (1991), as cited by Blau and Hameiri (2012), "The main objectives of online systems in educational organizations are to simplify the administration of learning programs and support communication" (p. 701).

By integrating technology into communication strategies, schools can quickly reach as many parents as possible. Teachers often indicate that it is difficult to reach all parents in a timely fashion. Email lists for parents have allowed technology to remedy this situation (Ramirez, 2001). Parents often complain that they don't know whether or not their child has homework. The use of teacher web sites has alleviated this concern as well. Teachers can post nightly or weekly homework assignments, updates about classroom activities, links to homework help sites, and information about upcoming tests, projects, or quizzes.

Students can also be actively involved in their education through the use of technology. Teachers can use Quia, which stands for Quintessential Instructional Archive, where teachers can create at-home tests and quizzes, assignments, and learning games, which students then access from any web browser. The yearly subscription cost is $49 and includes immediate grading and feedback for the student. The subscription includes the ability for a teacher to create a website, provide surveys to students for feedback, and also includes instant feedback and grading on tests

and quizzes. This site allows for students to utilize technology directly focused by the classroom teacher as a means to learn and be assessed.

Pearson's PowerSchool is a Student Information System employed in many districts in New Jersey and throughout the country. Pearson's original SIS, School Administration Student Information System (SASI), was phased out and PowerSchool took its place. Founded in 1997, PowerSchool installed its first program in a Salt Lake City middle school and expanded to over 2,000 schools by the time it was purchased by Apple in 2001. PowerSchool's web-based products report information on student performance, including grades, homework, and attendance to administrators, teachers, students, and parents. PowerSchool can be accessed from any Windows or MAC computer with a Web browser and supports Windows and MAC server platforms (Electronic Education Report, 2006). On December 1, 2011, PowerSchool hit its 10 millionth student mark when a student in Nova Scotia was enrolled through PowerSchool.

Another system widely used in the state of New Jersey is Edupoint's Genesis. From 1989 to 1997, Edupoint developed, marketed, installed, and supported the SASI III and SASIxp student information systems, which were then sold to NCS Pearson. Edupoint supported and developed new technology for the SASIxp product under a contract with Pearson School Systems from 1997 to 2002. Edupoint Educational Systems has been developing, marketing, installing, and supporting web-based student information systems since 2002. Edupoint's GENESEA special education system was released in 2002 and the GENESIS student information system was released in 2004. Today, there are over 185 districts in the state of New Jersey who employ the use of Genesis.

Realtime is an additional SIS utilized by districts in the state of New Jersey. As of October 29, 2012, Realtime is being utilized by 20% of the districts is New Jersey with 140 total districts. There are additional SISs used throughout the United States as well as internationally.

All of these products enable administrators, teachers, parents, and students to access grades, attendance, and information about fines along with bulletins about school news. These products also allow for state reporting through The Department of Education's New Jersey Standards Measurement and Resource for Teaching (NJSmart), which completed its first state submission in 2006. NJSMART houses information on students and teachers including assessment scores and evaluation scores. SISs also have IEP capabilities, can create the master schedule and student schedules from home or from school, and can map discipline and health records. These are comprehensive SISs that can be accessed and utilized at many different levels due to security settings. Students and parents receive login information so that they can access grades and attendance. Teachers, administrators, and counselors can have access to information as deemed appropriate by the chief school administrator.

Charlie Burgess, a junior in a high school in California is pleased with the electronic trend but feels he can build a better program that would draw in more students. “People want to communicate. That’s a given. They want to share their information. It’s the how that changes. Kids don’t write things in planners and put them in their backpacks and take them home. They want to communicate with school the same way they communicate in the rest of their lives—through multimedia. Because that’s what’s going on out there” (Riddle, 2010, p. 22). As a result, he is creating EduSweet, which combines the tools of SIS software with the appeal and connectivity of social networking sites.

To stay relevant in the 21st century, education institutions need to keep pace with the rapid changes introduced by digital media. Students' participation in this networked world suggests new ways of thinking about the role of education. What would it mean to really exploit the potential of the learning opportunities available through online resources and networks? What would it mean to reach beyond traditional education and civic institutions and enlist the help of others in young people's learning? Rather than assuming that education is primarily about preparing for jobs and careers, they question what it would mean to think of it as a process guiding youths' participation in public life more generally (Ito et al., 2009).

The use of technology within education is growing. Many teachers enjoy the ease of using technology to inform their students about current events and topics of interest within their subject matter. Administrators and teachers need to be aware that technology is not a panacea. Parents may be uncomfortable with the use of technology. Parents and students may not have home access to a computer or the Internet, which is needed for all of the technology explained above. Technology certainly improves the ease with which school staff can communicate with both parents and students.

While technology should be utilized in order to keep pace in the current world and to reach students where they are, there is little research on the benefits of such technology. Smart Boards, electronic grade books, Quia and the numerous other technological advancements available to students, parents, and teachers help students keep pace in today's marketplace. However, they are being widely used with little to no research on their impact on students' academic achievement or otherwise. "Despite massive student management information system introduction in schools in general and in their learning, behavior and attendance process in

particular, its possible impact on parents' involvement in school has been completely overlooked" (Telem & Pinto, 2006, p. 262).

Empirical Studies

Catherine A. Cameron and Kang Lee (1997) conducted two studies that explored the satisfaction of both parents and teachers with their accessibility to each other.

Study 1.

The researchers conducted a preliminary study in a middle class Canadian school district to evaluate the effectiveness of a brief implementation of a voicemail linkage between two classes in one school and its contribution to communications between teachers and parents. The participants were one kindergarten teacher, one fifth grade teacher, and 24 families (12 in each grade).

The design was experimental and mixed methods in nature with volunteering families being randomly assigned to either the voicemail intervention group or the nonintervention (control) group. Families and parents were also assigned questionnaires regarding their perceptions of home-school communication and were administered before and after the treatment.

At the lower level, the most common form of communication was face-to-face at drop off or pick up; at the higher level it was the child's homework book, in which the child recorded assignments in and the parent signed. Individual notes, parent-teacher conferences, and copied messages sent home continued along with the intervention of voicemail.

Before the study, families communicated with school on average once every other week, while the parents reported that teachers communicated once a week and both used notes as the primary form of communication. More than half of the parents, 71% of the participants, were

satisfied with the efforts they made to communicate with teachers; and 91% were highly satisfied with their teachers' responses to their communications, while 63% strongly agreed that increased communication between teachers and parents helps improve the home-school relationship.

During the three-week period utilizing voicemail communication, parents were in contact with teachers an average of once a week, which is a doubling of contact from less than one contact every two weeks made by the control group.

A 2 x 2 x 2 analysis yielded no significant effects on the variables hypothesized to enhance communications except for an interaction between treatment and grade level $F(1,56)= 18.04$; $p < .01$), indicating that there was general greater satisfaction in the higher grade in the comparison group. The researchers attribute this finding to the short duration and the fact that population was satisfied with the communication before the study.

Study 2.

The second study utilized a longer implementation period, six weeks, with a more diverse parent population. The previous school plus a school in a working-class neighborhood were solicited for this study. The participants included two teachers at the lower lever (kindergarten), one Grade 4 teacher and one Grade 5 teacher. In all, 44 families participated, approximately half of the total population of the classes. The design and procedure were unchanged from Study 1, increasing the duration from three weeks to six.

Pre-intervention, parents reported contacting their child's teacher less than once a week through notes (71%). Parents also indicated that the child's teacher had contacted them at the same rate, also using notes (66%).

Overall, parents felt voicemail was beneficial for (a) getting information about events (46%), (b) leaving brief messages (36%), (c) expressing concerns about a child (32%), and (d) obtaining homework assignments (27%).

After performing a 2 x 2 x 2 analysis of variance to determine treatment effects on home-school perceptions, a significant effect by grade level was found, $F(1, 56)=47.73$; $p < .01$, with parents of young children being generally more satisfied with attempts to communicate with school. A significant interaction was revealed between treatment and grade level, $F(1, 56)=17.82$; $p < .01$, at the upper levels, greater satisfaction was expressed with voicemail in this longer trial than with comparison messaging. The reverse was the case at the kindergarten level.

Teacher Responses

Before the study, teachers felt that parent-teacher conferences and the telephone were the most effective means of communicating with home. Following the study, teachers preferred voicemail and face-to-face interactions for specific messages but felt that written notes were still the best medium for general messages, test verification, and other technical functions such as permission slips. Voicemail was seen as best utilized for reminders and general information, while face-to-face contact was seen as best between in-depth discussions and those about behavior problems. As mirrored in Study 1's findings, the three major obstacles to home-school communications were work schedule conflicts (100%), lack of teacher release time (75%), and lack of parental interest (50%).

So while the quantitative piece of this study reported the number of school-to-home communications made by both the control and the treatment group, the study was still highly qualitative. At the higher levels, fourth and fifth grades, both parents and teachers preferred the use of voicemail as a means for communication. This could have been as a result of ease of use

and also convenience. It seems that for general information, the outgoing recorded message was the preferred method of communication by both parent and teacher.

Ina Blau and Mira Hameiri published a study in 2012 to measure parental involvement through online interactions through the school data system. This non-experimental quantitative study follows the online activities of students, teachers, and parents over a three-year period in seven Israeli high schools. Data were collected in regard to the logging of teachers, students, mothers, and fathers into the system, reporting data by teachers on a daily basis, and sending messages to teachers, students, mothers, and fathers. Data were also collected to measure the impact of teacher activity measured as daily data are entered on the use of the system by students and their parents and also to compare mother and father passive and active online parental involvement.

Over the period of three years, data were collected from 828 individual teachers who were consistently employed over the three-year period, their students, and parents. Activity was measured through teacher logins, the average number of logins into the system made by all of his or her students, mothers, and fathers. These measures were considered passive online activities. Active online activities were also measured at the teacher level and included the percentage of daily data entered by teachers into the system, number of messages sent by a teacher to all of his or her students, mothers, and fathers as well as the number of messages received by the teacher from his or her students, mothers, and fathers.

The number of messages sent by teachers to parents of their students significantly increased during all three years of the study (14.40, 20.95, and 27.63 messages on average, p's < .01). Teachers sent twice as many messages to the mothers of their students in comparison to the fathers of their students (28.21 versus 13.78 messages on average, p's < .001). Regarding the

effect on the number of parent logins into the system, statistically significant main effects were found for implementation time, parent gender, and significant interaction between the two variables. The number of messages sent by parents to teachers significantly increased during all three years of the study (14.96, 22.61, and 30.48 messages on average, p's < .01). The number of students who logged into the system with teachers who continuously logged into the system was 3.5 times higher than the number of students who logged into the system with low activity teachers. The number of parents who continuously logged into the system tripled over the three years if their children had high activity teachers. As was the case earlier, mothers were more likely to log into the system than fathers; however, father logins increased over the three years with high activity teachers.

Over the three-year implementation period, parent and student logins increased along with active parental interaction as defined by the sending of messages between teacher and parent. Also, the more actively the teacher entered data and logged into the system, the more often parents logged into the system. This study shows that over time, the use of electronic and online systems does increase active parental involvement.

Student Variables

Socioeconomic status, attendance, gender, and prior achievement are student variables that have been studied in relation to student achievement. It was concluded in The Coleman Report of 1966 that not only school variables such as school environment, teacher training, and materials such as textbooks influence student achievement, but also student level variables.

Socioeconomic Status and Student Achievement

In The Coleman Report of 1966 by Coleman, Campbell, Hobson, McPartland, Mood, Weinfield, and York, the authors noted the importance of family background factors in

predicting school achievement. The emerging idea was that SES was the greatest determinant of academic achievement, greater than school characteristics such as textbooks, facilities, and teacher quality. Coleman et al. (1966) concluded the following:

> It is known that socioeconomic factors bear a strong relation to academic achievement. When these factors are statistically controlled; however, it appears that differences between schools account for only a small fraction of differences in pupil achievement (p. 22).

The New Jersey Department of Education created a classification system called The District Factor Groups (DFGs). According to the New Jersey State Department of Education website's executive summary, "DFGs were first developed in 1975 for the purpose of comparing students' performance on statewide assessments across demographically similar school districts. The categories are updated every ten years when the Census Bureau releases the latest Decennial Census data." DFGs were created in response to data that SES affects student achievement.

In August of 2012, the TEACHNJ Act, which regulated the use of student growth predictors (SGPs), was signed into law in an effort to compare students with a similar testing history. Essentially, a student's growth would be compared to all the students in the state who earned the same score regardless of SES. While teachers and students have been evaluated using the SGP process beginning in the 2013-2014 school year, school districts are still classified by DFG and also peer grouped. In April of 2013, the New Jersey School Performance Report contained a new grouping system called peer groups. School districts were compared to their peer groups based upon "percent of students that are economically disadvantaged; i.e., free or reduced price lunch eligible, percent of students that are limited English proficient, percent of students that are in special education, and grade span of the school (elementary, middle, high, or

vocational high school) (Erlichson, 2013, p. 8). While teacher evaluation and individual student performance will be based upon SGPs, school districts' overall performance will be based upon their grades in certain categories based upon their peer grouping which takes into consideration SES through the percentage of students receiving free and/or reduced lunch.

Empirical Studies

In 2005 Selcuk Sirin conducted a meta-analysis of journal articles published between 1990 and 2000 on the subject of SES and student achievement.

> This study was designed to examine the magnitude of the relation between SES and academic achievement in the literature published from 1990-200. It was also designed to examine how the SES-achievement relation is moderated by (a) methodological characteristics, such as type of SES measure, the source of SES data and the unit of analysis; and (b) student characteristics, such as grade level, minority status, and school location. It was also designed to determine if there is a change in the correlation between SES and student achievement as defined through White's meta-analysis of 1982 (Sirin, 2005, p. 421).

The 58 published journal articles chosen for the study met the following criteria:

1. Apply a measure of SES and academic achievement.
2. Report quantitative data in sufficient statistical detail for calculation of correlations between SES and academic achievement.
3. Include in its sample students from Grades kindergarten through 12.
4. Be published in a professional journal between 1990-2000.
5. Include in its sample students in the United States.

The effect size used in this review was Pearson's correlation coefficient *r*. In order to address the problems of skewness, the correlations were converted into Fisher's *Z* scores and weighted to give greater weight to larger samples than smaller samples. The average effect-size scores were obtained through a *z*-to-*r* transformation (e.g., 1.96 for $\alpha = .05$).

The study's findings suggest an association between SES and academic achievement; however, it varies. At the student level, there is a medium association; but at the school level, there is a large association. "Family SES at the student level was one of the strongest correlations to student achievement and at the school level the correlations were stronger. (Sirin, 2005, p. 423). The review's overall findings suggest that the parents' location in the socioeconomic structure has a strong impact on student achievement.

Sarah Theule Lubienski (2006) used National Assessment of Educational Progress (NAEP) data to determine if there was a correlation between SES and math performance. Their study published in 2006 was focused on the research question "After controlling for differences in demographic characteristics and location, how does achievement in public schools compare with that in charter, Catholic, and other types of private schools?" The researchers chose to focus solely on math, as other subjects are more heavily influenced by home practices such as reading. The researchers suggest that math is primarily taught in schools. The sample contained 166,736 students across 6,664 schools in Grade 4 and 131,497 students across 5,377 schools in Grade 8.

Data were analyzed using the hierarchical linear model (HLM) with $p < .01$. Five models were utilized and included: Null Model, School Sector Only, Sector+Student Demographics, Sector+Student and School Demographics, and Sector+Demographics Location. At both fourth and eighth grades the mean mathematics achievement of charter school students

tended to be lower than that of other public school students, and the mean among public school students was lower than that for private school students.

Grade 4 HLMs show that when not controlling for demographic or other differences among schools, school achievement means were 10 points higher in Catholic schools, 11 points higher in Lutheran schools and "other" private schools, 4 points higher in conservative Christian schools, and 6 points lower in charter schools than public schools. In Model 3, which added student-level variables, the positive private school coefficients lost their significance and in the case of conservative Christian schools became negative. When in Model 4 school demographics were controlled for, all private school types became significantly negative. The addition of student and school level demographics in Models 3 and 4 had a strong effect on the private school coefficients; the private school advantage evident in Model 2 reversed after the higher proportions of advantaged or high SES students had been controlled. Model 5 showed that students within the same school with similar SES, LEP, and disability status scored lower than their White schoolmates. Students who were not White, Black, Hispanic, or American Indian had a lower mean than their White peers in the same school.

Grade 8 HLMs had similar results to that of Grade 4. School achievement means were 14 points higher in Catholic schools, 21 points higher in Lutheran schools, 14 points higher in other private schools, 5 points higher in conservative Christian schools, and 1 point higher than in charter schools and public schools. When school-level demographics were controlled for in Model 3, the positive private school coefficients were substantially reduced, yet the Catholic and Lutheran coefficients remained significantly positive. When both student and school demographic differences were controlled for in Model 4, public school means were significantly higher than those of Catholic and conservative Christian schools and statistically equal to means

for the other schools. Model 5 showed that once school location was controlled for, the results were similar to Model 4. Overall, the full model showed that in comparison to public schools, the mean mathematics achievement of Catholic schools with similar demographics in similar locations was statistically significant, 3.8 points lower, while the mean math achievement of similar conservative Christian schools was a significant 10.6 points lower. Again, as with Grade 4, Model 5 showed that for students within the same school with similar SES, LEP and disability status, their mean mathematics achievement depended upon their ethnic background. Students who were not White had a lower mean than their White peers in the same school. Also, Model 5 showed that school-level SES measures were significant correlates to achievement.

Although this research focused on the difference between public, private, and charter schools in regard to mathematics achievement, conclusions can be drawn about SES and student achievement. Once demographics and SES are controlled for, there are statistically significant correlations between SES and student achievement within the same school.

Judith Stull (2013) conducted a study using the Early Childhood Longitudinal Study (ECLS) to collect data about student achievement and SES. Data were collected from 22,000 children enrolled in 900 kindergarten programs in 2000. Data were collected in both the fall and spring and contained data collected from the child, parents, and teachers and included achievement and demographic information regarding all three groups. Regression analysis was conducted to determine a relationship.

Stull (2013) found that SES is the variable that most influences the child's achievement as well as the most statistically significant variable. With all other things being equal, every point higher on the family SES scale equates to a 3.389 increase in the child's achievement score.

Okpala, Okpala, and Smith studied the relationship between parental involvement, instructional expenditures, family socioeconomic attributes, and student achievement in their study published in 2001. The sample studied was from a county school unit in North Carolina with a diverse and transient population based upon their proximity to a military base. Their data were drawn from the 1995-1996 school years when the system was the fourth largest in the state. SES was measured by the percentage of students receiving free and reduced lunch, and parental involvement was measured by parental volunteer hours per 100 students.

The fourth grade sample of 4,256 students and their achievement in mathematics was the focus of this study. Achievement was measured through the use of end-of-grade tests mandated by the North Carolina Department of Public Instruction. The two measures used were the average student scale score and the percentage of students scoring at four different levels: Level 1, below basic; Level 2, basic; Level 3, proficient; and Level 4, advanced.

The percentage of students in free and reduced lunch was correlated negatively to mathematics scores, while the correlation between parent volunteer hours and mathematics achievement was very small as well as for expenditures on instructional supplies. The regression results showed that the percentage of students in free and reduced lunch programs negatively influenced mathematics scores.

As the researchers predicted, SES did influence the mathematics achievement in the county school system in North Carolina. Parental involvement and instructional expenditures did not have a significant influence on mathematics academic achievement.

Okpala extended the previous research on student demographics and their influence on achievement scores in North Carolina in 2002. Using the data from the same school system used in the 2001 study but this time for the 1993-1994, 1994-1995, and 1995-1996 school years,

Okpala looked at reading as well as math scores and additional variables such as teacher level of education, school size, and class size to add to her previous research on parental involvement, instructional expenditures, family socioeconomic attributes, and student achievement.

Pearson correlation analyses were performed for each of the three school years individually. The data showed a pattern among all three years that the percentage of students who mastered both math and reading improved from low-wealth to high-wealth schools. Also, students in schools with a higher percentage of parents with post-high school education performed significantly better than their peers with a lower percentage of parents with post-high school education.

The researchers noted that correlation does not mean causation and further analyzed the data using Ordinary Least Squares (OLS) regression analysis in an effort to determine causation. The OLS model found that the percentage of students enrolled in the free and reduced lunch program significantly influenced both math and reading scores negatively. Also, the percentage of students with parents with post-high school education significantly and positively influenced students' achievement in math and reading.

> The results from this paper do show that some of the major factors that are theoretically under the control of a school, such as educational level and teaching experience of staff, and school spending, have little if anything to do with student performance. Family socioeconomic factors prevailing in schools appear to contribute significantly to students' achievement (Okpala, 2002, p. 907).

In 1997, Caldas and Bankston III published a study on the influence of school population SES on individual student achievement. This study measured SES through

participation in free and reduced lunch programs on an individual basis, parents' educational and occupational level, the poverty status of the peer population through the percentage of school peers enrolled in the free and reduced lunch program, and the mean parental education and occupation levels for the school. The outcome variable studied was student performance on the Louisiana Department of Education's Graduation Exit Examination (GEE). The data were drawn from the population of tenth graders testing for the first time in 1990. The researchers excluded races other than White and Black to create a dichotomous independent variable and excluded students who were classified as special education due to the conditions under which they were tested, as they were different than that of the rest of the population. The final sample consisted of 42,041 sophomores who took the GEE for the first time in 1990.

The highest correlations among individual-level and school-level variables were between minority race and percentage of minority race in the schools as well as individual students' participation in the free and reduced lunch program and GEE test takers in the school who were participants in the free and reduced lunch program. This indicates that poor students attend schools with students who are disproportionately poor, and there is a tendency for students to be in schools with peers in similar family SES backgrounds.

Family social status and race had the strongest influence on academic achievement and both were moderately positive. Individual minority race had a strong negative affect on achievement when the racial composition of the school was controlled for. "Importantly, the effect of individual family social status remained unchanged when the racial composition of the school was factored in. This demonstrates again the well-documented, enduring, independent effect of family background SES on school achievement" (Caldas & Bankston, 1997, p. 274). The researchers most noteworthy finding was that attending school with classmates from a high

family background SES has a strong and significant contribution to academic achievement regardless of individual SES or race. SES has been noted as the strongest predictor of academic achievement.

Gender and Student Achievement

Gender is often the topic of research as a variable influencing student achievement. This is often most common in the areas of math and science. What researchers have discovered is that more often the attitude of the student and expectations of achievement are better indicators of success than gender alone. (Elwood, 2005; Bursal, 2013; Bloom, 1976).

Empirical Studies

Jehanzeb Cheema and Gary Galuzzo conducted a study in 2013, which focused on the achievement gap in math achievement in a large scale U.S. study: 4,733 fifteen-year-olds in the U.S. portion of the Program for International Student Assessment (PISA) database were studied. Data about race and gender's relationship to math achievement were analyzed using ANOVA, while multiple regression analysis was used to determine predictability of race and gender on math achievement.

The main objective of this study was to investigate the gender gap in math achievement in the United States in such a way that (1) relatively more accurate estimates of the effects of gender and other known predictors of math achievement, such as race, socioeconomic status, self-efficacy, anxiety, and so forth, are generated than those reported in past studies, and (2) results remain generalizable at the national level. (Cheema & Galuzzo, 2013, p. 108)

The findings from the ANOVA analysis showed a small but significant gender achievement gap in math. The gap persisted when demographic information was introduced to the model. The gap disappeared when self-efficacy and anxiety were added to the model. "The

implication here is that once we properly control for math-specific student characteristics, such as math self-efficacy and math anxiety, in addition to demographic characteristics students tend to perform equally well on math irrespective of their gender" (Cheema & Galuzzo, 2013, p.109).

Ma (2008) also utilized PISA 2000 data to determine the extent of within-school gender differences in reading, mathematics, and science performance variance and what school characteristics account for these gender differences. Hierarchical linear modeling was used to analyze the data. This was a two-level model with students in the first model and schools in the second. Unlike Cheema and Galuzzo (2013), Ma used each country represented in the PISA database.

It was determined that with regard to reading achievement, there were gender gaps in all countries, save Romania, that favored females. "The absence of variation indicated that all schools demonstrated a similar female advantage " (Ma, 2008, p. 446). Gender gaps in math were discovered in 29 countries and were determined to be small, but the United States showed no gender gaps in math achievement. Gender differences in science achievement were generally small, favoring males in 14 countries and females in five. Again in the United States there was no reported gender gap in achievement; however, there were variations among schools as there was with math achievement.

Although the gender gap was determined to be small, it did exist across the sample. Females were favored in the area of reading, while males were favored in math and sciences. It was interesting to note that in the United States specifically, no gender gap was determined for math and science; but a significant gender gap favoring females was determined in reading.

Murat Bursal (2013) found that females are outperforming their male peers academically and specifically in science. Murat Bursal conducted his study in Turkey, where he

focused specifically on science achievement between fourth and eighth grades in his longitudinal study. After analyzing longitudinal data using ANOVA and MANCOVA, "the significance level was used as $\alpha = .05$ in all statistical analyses. When MANCOVA was used, the Bonferroni correction method was employed, where the alpha level was divided by the number of dependent variables to ensure that the total error rate does not exceed the 5% level" (Pallant, 2007, as quoted by Bursal, 2013, p. 1153). While all of the science scores declined from fourth to eighth grade, the boys' scores showed a sharper decline. MANCOVA analysis proved that there was a significant difference in scores for eighth grade only, and the effect size had a medium effect on eighth grade science scores.

Warren Willingham and Nancy Cole (1997), both of Educational Testing Service (ETS), conducted a four-year study involving millions of students at the fourth, eighth, and twelfth grade levels. In 1960, there were documented achievement gaps in relation to gender in that girls scored higher in liberal arts while boys scored higher in math in science. Willingham and Cole found that these gaps had narrowed and there was no more male advantage. Essentially, the researchers drew the conclusion that gender alone does not predict achievement in math science or liberal arts.

Fan, Chen and Matsumoto (1997) furthered the research on gender differences in math achievement using NELS data from 1988. They focused on the first three waves of data including eighth, tenth, and twelfth grade. The researchers found that males had s slight advantage over females, but the effect sizes were small, ranging from 0.03 and 0.08. This remained consistent over all three grades. The researchers also studied the students at the high end of the score distribution and found that in the 75th percentile, the 90th percentile, and the 95th percentile, more males than females were represented at these higher levels.

The researchers determined that in the higher end of the score distribution the gender differences increased from eighth to twelfth grade. Also, the number of females represented in the upper percentiles diminished.

When the total population was examined, there was a very small gender difference in achievement; however, when the students who performed at the top percentiles of math achievement were studied, the gender differences increased to show that males achieved higher scores than their female counterparts, of which there were fewer.

McGraw, Lubienski, and Strutchens (2006) also analyzed data on differences in gender achievement using NAEP mathematics scores from the 2003 administration. They discovered findings similar to Fan, Chen, and Matsumoto (1997) that while gaps are consistent across reporting years, the differences measured are small. Also similar to the findings using the NELS data, as the math scores increased, so did the gap between male/female achievements favoring the males.

While scores for males and females have increased over the years, the gender gap has not decreased. The researchers discovered that at all levels studied, four, eight, and twelve, all content area scores favored males. As the grade level increased, the gaps became larger.

Gender achievement gaps posited in the 1960s are narrowing as evidenced by more current research. Researchers are determining that student attitudes, study habits, and feelings toward the subject are a better determinant of academic achievement than gender alone. It is important to note that while gender gaps seem to be small when looking at a large population, when examining students at the higher end of achievement scores, the gaps seem to widen, favoring males (Fan, Chen, & Matsumoto, 1997; McGraw, Lubienski, & Strutchens, 2006).

Prior Achievement and Academic Achievement

Prior achievement is a variable that is often studied in relation to student achievement. Researchers have discovered that a student's past academic performance is a significant predictor of future academic performance (Scott et al., 2007; Sparkman et al., & DeBerard et al., 2004). Essentially, students who perform at or above grade level proficiency in the lower grades will continue to do so in later years. Also, GPA achieved in high school will predict college success.

Empirical Studies

In September of 2007, Scott, Ingels, and Owings analyzed data from the National Education Longitudinal Study from 1988 (NELS:88) and National Assessment of Educational Progress (NAEP) to explore the variables that affect mathematics achievement. Both cross-sectional and longitudinal analyses were conducted. The data were tested for statistical significance at the .05 level.

The 1992 cross-sectional data available in NELS:88 were compared to seniors in 1992 who took NAEP mathematics. Data were compared from transcripts as well as test data. Ninety-one percent of students scoring in the lowest quarter of the NELS:88 eighth grade achievement distribution had a below basic NELS:88 twelfth grade NAEP-scaled score in 1992. Of the top 25% of eighth grade mathematics in 1988, 44% were at the Proficient or Advanced levels of NAEP-scaled achievement as seniors. Students' scores on the 1988 NELS: 88 eighth grade mathematics assessments correlated .82 with their NELS: 88 twelfth grade mathematics scores, as expressed on the NAEP scale. Transcript data revealed that seniors' mathematics GPA was positively related to their 1992 NELS:88 NAEP-scaled mathematics achievement at 0.59.

Prior achievement as a predictor for academic achievement is often studied to determine a link to college performance. DeBerard, Spielmans, and Julka (2004) conducted a study to

determine predictors of academic achievement and retention among college freshmen. Overall, high school GPA and SAT scores were considered predictor variables. The researchers predicted that higher GPA and SAT scores in high school would relate to higher freshmen GPAs and lower attrition rates. This was only one of ten variables studied, and of the ten the only statistically significant correlate of retention was low high school GPA to low retention rates. This was a modest correlation at .20. GPA and SAT scores in high school were statistically significant and positively correlated to academic achievement.

A similar study was conducted by Sparkman, Maulding, and Roberts (2012) to determine the influence of non-cognitive predictors of student achievement. Two of the variables included in this study were high school GPA and composite ACT score. A multiple regression analysis was conducted to test the relationship between high school GPA and ACT scores and cumulative GPA five years after a student's initial enrollment in the university or upon graduation before five years. The results indicate that high school GPA and ACT scores statistically significantly predict cumulative GPA five years after enrollment or upon graduation.

These studies indicate that prior achievement is a statistically significant predictor variable for student achievement. If a student has performed at a high or proficient level in the past, he or she will continue to do so.

Attendance and Student Achievement

Student attendance is another variable that is typically explored when discussing influences on student achievement. It is intuitive to assume that students who are not present in class are missing out on valuable information being taught in the classroom. Therefore, students with low attendance would then exhibit lower achievement. According to the New Jersey Department of Education (NJDOE), absenteeism can lead to poor academic achievement, school

dropout, delinquency, and gang violence. As a result, the state of New Jersey has a compulsory attendance law that states the following:

> The compulsory education law (N.J.S.A. 18A:38-28 through 31) requires all children between the ages of 6-16 to attend school. The attendance regulations (N.J.A.C. 16:6-7.8), require each district board of education to develop, adopt and implement policies and procedures regarding the attendance of students, including the adoption of a definition of "unexcused absence," and the provision of mandated services for students with between one and nine cumulative unexcused absences and a mandated court referral for truant students, those with ten or more cumulative unexcused absences (NJDOE, n.d.).

Empirical Studies

Dr. Douglas Roby (2003) conducted a study to determine a link between attendance rates and scores on the Ohio Proficiency Test in Grades 4, 6, 9, and 12. He utilized 3,171 complete samples accessed from the Ohio Department of Education website, which posted data regarding attendance rates and test scores. Building attendance averages were used to determine if there was a significant, positive relationship between attendance and student achievement. The correlation of student achievement and attendance is moderate to strong with the most significant relationship occurring in ninth grade. The study's findings suggest that at all grade levels studied, four, six, nine, and twelve, there was a significant relationship.

Joyce Epstein has spent the lion's share of her career in education studying parental involvement and its relation to student achievement. Part of parental involvement as defined by Epstein includes student attendance. In 2002, Epstein and Sheldon published a study that reported the need for schools to improve their attendance rates through parent and community

involvement. Epstein and Sheldon found that when schools focused on improving attendance rates through new policies and interventions, attendance rates and chronic absenteeism among elementary school children improved.

Sheldon and Epstein (2004) studied the effect of parental involvement and student absenteeism to expand upon their 2002 study. According to Kamdin (1996) and Myers (2000) as quoted by Sheldon and Epstein (2004), students with higher attendance rates have higher scores on standardized achievement assessments. This study utilized longitudinal data from 39 schools that provided data on chronic absenteeism for the 1999-2000 and 2000-2001 school years. The schools provided the percentage of students who missed 20 days or more of school.

The researchers asked the schools to implement 14 attendance-focused activities during the 2000-2001 school year to determine if attendance rates improved. Regression analysis was used to determine a relationship between chronic absenteeism and school practices to improve absenteeism, while ordinary least squares regression analysis tested the effects of particular interventions over time.

The results show that chronic absenteeism was the strongest predictor of absenteeism, while schools that utilized communication practices to notify families of students' attendance reported significantly lower rates of absenteeism.

A large-scale study, which focused on the attendance and mobility rates and their effect on mathematics achievement in Pittsburgh, Pennsylvania, was conducted by Parke and Kanyongo in 2012. The study's sample included students in Grades 1-12. Data were collected and researchers classified students as stable attenders, stable non-attenders, mobile attenders, and mobile non-attenders. These data were collected from the district's SIS system, Realtime. Mathematics and reading data were collected from the Pennsylvania System of School

Assessment (PSSA) at Grades 8 and 11. Ultimately, attendance rates declined in the upper grades and stable attenders had a higher mean scaled score than the other three categories. Also, while White students had higher mean scores overall than Black students, both groups had similar patterns, which meant that regardless of a student's ethnicity, their attendance impacted their mathematics achievement.

Gottfried (2010) studied the relationship between student attendance and achievement in urban elementary and middle schools. The data were collected from all Philadelphia elementary and middle schools from the 1994-1995 school year to the 2000-2001 school years. This equated to 223 schools with a total of 86,000 students, Grades K-8. Achievement was measured through GPA, while attendance was measured by the total days present in a given school year.

The results show that the coefficients on days present are positive and significant, which suggest that attending school is correlated to higher GPA. These findings were consistent across elementary and middle school samples. To further strengthen the baseline results, Gottfried (2010) utilized the following:

> A value-added model that incorporates a one-year lagged measure of student-level GPA as independent variable, as determined by subtracting the historical model of achievement with respect to *t*-1 from the model with respect to *t.* As described, this lag is assumed to capture historical information about a student (p. 448).

These results mirrored the baseline model coefficients and showed that the relationship between attendance and GPA is positive and significant at both levels but slightly stronger at the middle school level. The researchers extended the study to determine a relationship between attendance and standardized test scores for which they also determined a relationship.

Attendance is a student variable that has been proven by researchers to have a significant relationship to student achievement. Students with low attendance exhibit lower achievement. Students with higher levels of attendance exhibit higher achievement and graduation rates. These results are consistent at the elementary, middle, and high school levels.

Conclusion

While there are numerous empirical studies on parental involvement, few are quantitative and the results are widely inconsistent. Parental involvement is touted at the federal level as something that will improve academic achievment, yet this seems intuitive and not always supported by research. When the definition of PI is narrowed down to communication, it becomes something that can be measured.

Advancements in technology abound and have trickled down to the classroom. Schools have employed the use of smartboards, iPads, and Quia. As a means to improve the communication between schools and home, there have also been advancements in Student Information Systems. The systems allow parents and students to log into Parent Portal to access information on grades, attendance, and student progress. This information is live and in many districts has replaced untimely paper progress reports and report cards being mailed home. These advancements aid in strengthing the communication between home and school.

While the research shows that parental involvement does have a postitve influence on student achievement (Fan, 2001; Fan & Chen, 2001; Fehrmann, Keith, & Reimers, 1987; Sanders, Epstein, & Connors-Tadros, 1999) and that school level factors do not (Hanushek, 1997; Okpala, 2002; Okpala, Okpala, & Smith, 2001; Caldas & Bankston III, 1997), the Parent Portal effectively combines the two. Parent Portal is a school-level factor that bridges the gap to home. Will Parent Portal access have an influence on student achievement in this hybrid status of

both school level factor and home/parental involvement factor? This research will add to the body of literature on parental involvement by defining parental involvement as communication which can be measured through the number of logins to the Parent Portal. This will add quantitative research on a topic where it is currently lacking. This will also add to the small amount of research on technology as a means of communication between home and school.

CHAPTER III

DESIGN AND METHODOLOGY

Introduction

Parental involvement became an important subject in education with the publishing of The Coleman Report of 1966, which exposed the fact that student background characteristics account for nearly as much variance on student achievement as do school characteristics. It was at this time that education began being considered from a sociological standpoint. One of those background characteristics is Parental involvement, which is a term that has many definitions. Joyce Epstein's (2009) framework outlines six specific types of parental involvement. It has also been defined as parental interest in a student's social and academic life (Keith et al., 1986; Pomerantz et al., 2007). Walberg (1986) defines parental involvement as communication between home and school. Finn (1998) defines parental involvement using three areas of interest, including homework monitoring, helping with homework, and discussing school matters. Other researchers use a combined approach by defining parental involvement as parental involvement in school and school-to-home communication. (Denessen et al., 2007).

In an effort to more succinctly define parental involvement to drive the research and methodology, I used Epstein's Overlapping Spheres of Influence (2001) and also her six-part framework to build a conceptual framework with school-to-home communication as the emerging definition of parental involvement. The purpose of this primarily quantitative study was to study the relationship, if any, between Parent Portal access and student achievement when controlling for gender, socioeconomic status (free and reduced lunch), ELL, SPED, student attendance, and previous achievement. The purpose of the qualitative portion of the study was to

determine if Parent Portal access increases school-to-home communication, specifically on the part of the parent or guardian.

A mixed-methods approach was utilized to combine the quantitative and qualitative approach. According to Johnson and Onwuegbuzie (2004), a mixed methods approach aims to provide a workable solution through a more balanced approach to research. This was a non-experimental, explanatory design.

This chapter contains the researcher's design and methods for both the quantitative and qualitative portion of the study. The population, sample, data collection, and analyses are presented first for the quantitative design. The qualitative design follows and presented is the population, sample, data collection, instrumentation and analyses are presented.

Research Questions

The overarching research question guiding the study is the following: What is the nature of the relationship between the use of Parent Portal as a proxy for parent home/school communication and student achievement in a suburban middle school?

Research Question 1. What evidence, if any, exists that suggests access to and the use of Parent Portal improves parent involvement as defined by the level of home-to-school communication?

Research Question 2. What evidence, if any, exists that suggests access to and the use of Parent Portal improves parent/student communication?

Research Question 3. What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by GPA when controlling for gender, attendance, free and reduced lunch status, and ethnicity?

Research Question 4. What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by NJ ASK 6 Math scores?

Research Question 5. What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by NJ ASK 6 Language Arts scores?

Research Question 6. What influence, if any, does access to and the use of Parent Portal have on student attendance rates?

Null Hypotheses

Null Hypothesis 3. No statistically significant relationship exists between Parent Portal access and sixth grade student GPA when controlling for gender, attendance, free and reduced lunch status, and attendance.

Null Hypothesis 4. No statistically significant relationship exists between Parent Portal access and sixth grade student performance scores on NJ ASK 6 Math.

Null Hypothesis 5. No statistically significant relationship exists between Parent Portal access and sixth grade student performance scores on NJ ASK 6 Language Arts Literacy.

Null Hypothesis 6. No statistically significant relationship exists between Parent Portal access and sixth grade student attendance rates.

Research Design

Population and Sample

The population for this study included the students and families of sixth graders in a district in northern New Jersey. Only student data that met the following criteria were extracted: (a) attended both fifth and sixth grade in the district, (b) had composite scores for both NJ ASK 5 and NJ ASK 6, and (c) had access to Parent Portal. In order to compare NJ ASK 5 scores, when

parents did not have access to Parent Portal and NJ ASK 6 scores when it was made available to parents, students must have been enrolled in the district both years to be included in the sample.

The sample size utilized in this study was 209 students in the sixth grade enrolled in two middle schools located in the same town and district. These schools were sampled as one, with one school having a sample size of 108 and the other with a sample size of 101, equaling a total of 209 students. The middle schools are located in northern New Jersey with a population of 18,000, which can be broken into the following ethnicities: 68.1% White, not Hispanic; 14.1% Hispanic; 2.9% Black; 13.1% Asian; and 2.7% multi-racial. Five percent of the sample qualifies for the free and reduced lunch program.

Quantitative Data Collection

Letters are mailed at the beginning of each school year to the parents in the district with students in Grades 6-12 (see Appendix C). Each letter contains confidential login information for each student's account. Parents are also provided with instructions detailing the use of the website as well as the regulations that teachers will follow in terms of data entry.

Teachers are mandated to enter data on a weekly basis to ensure up-to-date and timely information. Teachers are required by policy to enter homework, assessments, and participation scores. They must also enter daily attendance data, while the attendance officer enters and maintains cumulative attendance data. Teachers are permitted to follow their own grading policies and can use a percentage or total point value when assigning grades.

Data were collected from PowerSchool, including grades, attendance rates, Parent Portal access rates, and NJASK 5 and 6 scores. PowerSchool is the district's Student Information System that houses all demographic, academic, and attendance information. Data were extracted using student IDs in order to protect anonymity. Data were also extracted in

relation to parental access to Parent Portal, which houses academic and attendance data related to their child. Data are tracked concerning number of logins, dates, times, and durations of access. It should be noted that although letters are addressed to parents, a student could also access the system if their parents provide them with the code. Due to the fact that I cannot differentiate between parent and student access, this is a limitation of the study.

Data were collected by a district-employed member of the technology department who utilized Excel files to organize the data. I received a single, cross-sectional sample, as the data relating to parental access rates is deleted from PowerSchool once the data rollover to the next school year takes place.

New Jersey Assessment of Skills and Knowledge Standardized Test

The New Jersey Assessment of Skills and Knowledge (NJ ASK) is administered in Grades 3-8 and "is designed to give an early indication of the progress students are making in mastering the knowledge and skills described in New Jersey's Core Curriculum Content Standards (CCCS). In addition, these assessments fulfill the requirements under the 2001 No Child Left Behind (NCLB) Act" (NJDOE, 2013, p. 2). In Grade 6, students are tested in two content areas, Language Arts and Math. The reported scaled scores are as follows: Partially Proficient, 100-199; Proficient, 200-249; and Advanced Proficient, 250-300 (NJDOE, 2013).

Reliability

The New Jersey Department of Education is required by federal law to ensure that the instruments it uses to measure student achievement for school accountability provide reliable results (NJDOE, 2012, p. 114).

Consistency of individual student performance was estimated using Cronbach's coefficient alpha. Coefficient alpha is conceptualized as the proportion of total raw score

variance that may be attributed to a student's true score variance. Ideally, more score variance should be attributable to true test scores than to measurement error. Alpha is an appropriate index of internal consistency for use on untimed tests such as NJ ASK.

Cronbach's alpha is a measure of internal consistency or in this case how related the items in the NJ ASK assessment are to one another, which in turn determines the reliability of the assessment. The reported accepted value of alpha ranges from .70-.90. If an alpha value is too low, it could be because of too few items, poor interrelatedness of items, or heterogeneous constructs. Conversely, an alpha value above .90 could mean redundancies of items being tested (Tavakol & Dennick, 2011).

Table 1

Summary of Coefficient Alpha and SEM by Content Area

		MC	CR	SCR	Max Points	Alpha	SEM
LAL		**36**	**6**		**70**	**.90**	**3.42**
	Writing		2		18	.77	1.25
	Reading	36	4		52	.89	2.89
	Working with text	*23*			*23*	*.81*	*2.04*
	Analyzing text	*13*	*4*		*29*	*.81*	*2.03*
Math		**32**	**3**	**8**	**49**	**0.93**	**3.05**
	Number &	10	0	3	13	0.81	1.45

	Numerical Operations						
	Geometry & Measurement	10	1	1	14	0.76	1.73
	Patterns and Algebra	9	1	2	14	0.78	1.58
	Data Analysis, Probability, & discrete Mathematics	3	1	2	8	0.65	1.31
	Problem Solving	*12*	*2*	*3*	*21*	*0.85*	*2.37*
	Calculator	*20*	*2*	*0*	*26*	*0.86*	*2.26*

Table 2

*Grade 6 Coefficient Alpha and SEM for MC Clusters and SCRs**

	Subject/Cluster	Number of Items	Alpha	SEM
LAL MC		**36**	**0.87**	**2.59**
	Working with Text	23	0.81	2.04

	Analyzing Text	13	0.71	1.59
Math MC		**32**	**0.90**	**2.24**
	Number & Numerical Operations	10	0.74	1.26
	Geometry & Measurement	10	0.73	1.30
	Patterns & Algebra	9	0.70	1.17
	Data Analysis, Probability, & Discrete Mathematics	3	0.55	0.59
	Problem Solving	*12*	*0.78*	*1.41*
	Calculator	*20*	*0.85*	*1.79*
	Math SCR	8	0.75	1.16

Validity

The New Jersey Department of Education 2012 Technical Report on the NJ ASK contains information which addresses the topic of validity:

> Baker and Linn (2002) suggest that two questions are central in the evaluation of content aspects of validity: (1) Is the definition of the content domain to be assessed adequate and appropriate? (2) Does the test provide an adequate representation of the content domain the test is intended to measure? (NJDOE, 2013, p. 6).

The answer to the question of appropriateness of content definition is addressed through the introduction to the Common Core Content Standards (CCCS). The State Board of Education adopted the CCCS in 1996. Through a lengthy review process with numerous stakeholders, the 2004 NJCCCS or New Jersey Common Core Content Standards were adopted in New Jersey. The State Board of Education implemented all aspects of standards-based reform in response to the NJCCCS.

The question of adequacy of content representation is also addressed in the 2012 NJ ASK Technical Report. It states that test items were carefully constructed in alignment with both the CCCS and NJCCCS and that New Jersey test specifications were followed. Additionally, New Jersey content experts, teachers, and the Sensitivity Committee conducted careful review of the test items. Further, item writers with specific qualifications were trained and validated.

The CCCS are represented on each test by balancing sub-domain coverage on each test, by proportionally representing items corresponding to Partially Proficient, Proficient, and Advanced Proficient performance categories on each test, and by matching item format to the requirements of the content and standards descriptions" (NJDOE, 2013, p. 141).

The New Jersey Assessment of Skills and Knowledge standardized test is currently administered to students in Grades 3-8 in the content areas of Language Arts, Mathematics, and science.

Data Analysis

Pearson *r* correlations were utilized to determine relationships between both the dependent variables NJ ASK composite scores and GPA and the independent variables Parent Portal access rates and attendance. Multiple regressions were used to analyze the association and the strength of that association, if any, between the independent/predictor variables previously mentioned and the dependent/outcome variables NJ ASK composite scores and student GPA.

A qualitative method was employed to determine the effect of Parent Portal access on school-to-home communication from the parents' perspectives. The qualitative method was used to complement the quantitative data, "The major characteristics of traditional qualitative research are induction, discovery, exploration, theory/hypothesis generation, and the researcher as primary 'instrument' of data collection (Johnson & Onwuegbuzie, p. 18). This design was used to answer the research questions "What influence, if any, does access to and use of Parent Portal have on parent involvement as defined by home to school communication? What evidence, if any, exists that suggests the use of electronic grade book improves parent involvement as defined by the level of home-to-school communication? Qualitative data allow the researcher to collect data that are "responsive to local situations, conditions, and stakeholders' needs." (Johnson & Onwuegbuzie, p. 20).

Qualitative Data Collection

Data were collected from parents of students who completed the sixth grade year. The parents were randomly sampled from students in the sixth grade who accessed Parent Portal throughout the 2012-2013 school year. The instrument used was a survey. A message was sent to

all parents of sixth grade students through the Connect 5 email alert system with a letter explaining the research project, data collection, and survey procedures. The head of the technology department employed by the district sent this message.

Surveys were sought from sixth grade parents in the district with access to Parent Portal. A link to the survey was sent through the Connect 5 email alert system. Parents could click on the hyperlink embedded in the email to complete the survey through Survey Monkey.

Assumptions, Ethical Considerations, and the Role of the Researcher

The researcher assumes that all participants will answer the survey questions honestly and openly. Other assumptions include that parents use the Parent Portal to aid in helping their child's educational progress and that students use the Parent Portal to guide their study and homework habits. Lastly, the researcher assumes that GPA is a valid measure of academic performance for the population.

Ethical considerations were addressed in several ways. First, the researcher garnered permission for the study by the district's superintendent of schools. Second, a letter was sent home to the parents of students in sixth grade to introduce the study, explain the research, the data collection, and the analysis process. All data were kept anonymous and were classified through student identification codes.

The researcher does have a connection to the school district as an employee for the past two years; however, the researcher does not work in the middle schools from which the population was sampled.

Summary

This chapter served as an explanation of the design and method of this mixed-methods research study. The qualitative data collection, completed through survey, was completed before

the quantitative data collection. The survey was implemented first due to the nature of the time frame of availability of the necessary data.

The quantitative data were collected from Pearson's PowerSchool, which is the district's student information system. Data such as attendance rates, SES, gender, NJ ASK scores, and Parent Portal access rates were all collected. These variables were then analyzed to determine the relationships, which may or may not have existed.

Chapter IV provides a detailed explanation of the analysis and results from all aspects of the data collection.

CHAPTER IV

ANALYSIS OF THE DATA

Introduction

The purpose of this study was to determine a relationship, if any, between access to Parent Portal and student achievement as measured by GPA and scores on the New Jersey Assessment of Skills and Knowledge for Grades 5 and 6. Additionally, I examined specific models, including the independent variables gender, ethnicity, attendance, and eligibility for the federal free and reduced lunch program that, when paired with number of parent logins, may influence the dependent or outcome variable of performance on the NJ ASK and student GPA. To determine the influence of Parent Portal access and school-to-home communication, analysis was conducted on survey responses regarding experiences with the Parent Portal completed by the parents from the sample population. This study was designed to determine the presence of an influence of Parent Portal access on student achievement, school-to-home communication and parent-to-student communication.

This chapter is organized by research question and begins with the data collection and analysis of the results from the qualitative data collected from the survey for Research Questions 1 and 2. Data collections and analyses and results for Research Questions 4-6 follow. Research Questions 4-6 are answered through multiple regression analysis.

Research Questions

Individual quantitative analysis of survey data and student academic performance, as measured by NJ ASK standardized assessment data and student GPA, was used to answer the following research questions:

Research Question 1. What evidence, if any, exists that suggests access to and the use of Parent Portal improves parent involvement as defined by the level of home-to-school communication?

Research Question 2. What evidence, if any, exists that suggests access to and the use of Parent Portal improves parent/student communication?

Research Question 3. What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by GPA when controlling for gender, attendance, free and reduced lunch status, and ethnicity?

Research Question 4. What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by NJ ASK 6 Math scores?

Research Question 5. What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by NJ ASK 6 Language Arts scores?

Research Question 6. What influence, if any, does access to and the use of Parent Portal have on student attendance rates?

Null Hypotheses

Null Hypothesis 3. No statistically significant relationship exists between Parent Portal access and sixth grade student GPA for the school year 2012 when controlling for gender, attendance, free and reduced lunch status, and ethnicity.

Null Hypothesis 4. No statistically significant relationship exists between Parent Portal access and sixth grade student performance scores on NJ ASK 6 Math.

Null Hypothesis 5. No statistically significant relationship exists between Parent Portal access and sixth grade student performance scores on NJ ASK 6 Language Arts Literacy.

Null Hypothesis 6. No statistically significant relationship exists between Parent Portal access and sixth grade student attendance rates.

Data Collection: Research Questions 1 and 2

A survey (see Appendix C) was administered via the email alert system employed by the school to answer Research Questions 1 and 2. The questions in the survey focused on the subject of school-to-home communication and also parent-to-student communication. There were also questions regarding demographic data such as age, ethnicity, gender, and so forth. An email alert was sent home to the parents/guardians in the study with a link to access the 28-question survey. Parents/guardians were instructed to complete the survey, only once per family. The survey was sent to 200 families in the population to which I received 49 responses, which is a 24.5% response rate. Due to the low response rate, inferences toward the entire population are difficult. Response data were collected through Survey Monkey and analyzed in SPSS Version 21.

The following are the descriptive statistics for the demographic information collected from survey participants, which includes gender, age, highest level of education, ethnicity, and total number of times Parent Portal was checked in the quarter. The school district utilized in the study runs on a quarter system. There are four quarters in the school year. An email alert is sent at the halfway mark of the quarter and then again at the conclusion of the quarter to remind parents to check the portal to monitor students' progress at the halfway mark and to check final grades at the culmination of the quarter.

Table 3

Frequency Table Demographic Information

Total Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	9	18.4	18.4	18.4
	Female	40	81.6	81.6	100.0
	Total	49	100.0	100.0	

Total Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	31-40	9	18.4	18.4	18.4
	41-50	28	57.1	57.1	75.5
	51-60	11	22.4	22.4	98.0
	61+	1	2.0	2.0	100.0
	Total	49	100.0	100.0	

Total Ethnicity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	African American	1	2.0	2.0	2.0
	Asian	6	12.2	12.2	14.3
	Hispanic	4	8.2	8.2	22.4
	White	37	75.5	75.5	98.0
	Prefer not to respond	1	2.0	2.0	100.0
	Total	49	100.0	100.0	

Total Ed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School	3	6.1	6.1	6.1
	Trade School	2	4.1	4.1	10.2
	Some College	10	20.4	20.4	30.6
	College	23	46.9	46.9	77.6
	Advanced Degree	11	22.4	22.4	100.0
	Total	49	100.0	100.0	

Total Portal Access

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-4 times a quarter	13	26.5	26.5	26.5
	5-10 times a quarter	16	32.7	32.7	59.2
	10+ times a quarter	20	40.8	40.8	100.0
	Total	49	100.0	100.0	

A total of 49 parents or guardians participated in the survey. These participants were asked questions regarding demographic information, including gender, age, ethnicity, level of education, and number of times in which they accessed the portal. The largest percentages of respondents were female at 81.6%. Respondents were given the option of age ranges from 20 to 61 and above; and 57% identified as being in the 41-50-age range, with 22.4% in the 51-60 range and 18.4% in the 31-40 ranges. Of the respondents, 75.5% identified as being White; and 12.2% of the participants identified as being Asian, which was the second highest percentage. The largest percentage, 46.9% of respondents, identified as having a college degree, while 20.4% reported some college, and 22.4% reported earning an advanced degree. Finally, respondents were asked how many times a quarter they accessed or logged into the Parent Portal. Ten plus times a quarter was the most frequent choice, garnering 40.8% of the total responses; 5-10 a quarter was the second most popular being chosen by 32.7% of the respondents; and 1-4 times a quarter garnered 26.5% of the respondents' choices.

Respondents were prompted to comment on the methods they use to communicate with the school and also which school-related activities they participated in during the past year. For these questions respondents were asked to choose all responses that applied to them. When asked about methods of communication, 87.8% of respondents chose email as a mode of

communication, 16.3% selected phone calls, and 14.3% of respondents chose written notes. When asked about which activities respondents participated in over the past school year, the following was reported: 24.5% attended PTSA Meetings, 57.1% attended concerts, 22.4% attended parent programs offered by the district, 89.9% attended Back to School Night, and 63.3% attended parent-teacher meetings.

Table 4

Frequency Tables Methods of Communication with School

Which method do you most use to communicate with school? Check the response that best answers the question.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Email	43	87.8	100.0	100.0
Missing	System	6	12.2		
Total		49	100.0		

Which method do you most use to communicate with school? Check the response that best answers the question.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Phone Call	8	16.3	100.0	100.0
Missing	System	41	83.7		
Total		49	100.0		

Which method do you most use to communicate with school? Check the response that best answers the question.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Written Note	7	14.3	100.0	100.0
Missing	System	42	85.7		
Total		49	100.0		

Table 5

Frequency Tables of School Activities Participated In

How many of the following activities did you participate in during the last school year? Please check all that apply.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PTSA meetings	12	24.5	100.0	100.0
Missing	System	37	75.5		
Total		49	100.0		

How many of the following activities did you participate in during the last school year? Please check all that apply.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Concerts	28	57.1	100.0	100.0
Missing	System	21	42.9		
Total		49	100.0		

How many of the following activities did you participate in during the last school year? Please check all that apply.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Parent Programs	11	22.4	100.0	100.0
Missing	System	38	77.6		
Total		49	100.0		

How many of the following activities did you participate in during the last school year? Please check all that apply.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Back to School Night	44	89.8	100.0	100.0
Missing	System	5	10.2		
Total		49	100.0		

How many of the following activities did you participate in during the last school year? Please check all that apply.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Parent/Teacher Meetings	31	63.3	100.0	100.0
Missing	System	18	36.7		
Total		49	100.0		

Research Question 1 – Analysis and Results

What evidence, if any, exists that suggests access to and the use of Parent Portal improves parent involvement as defined by the level of home-to-school communication?

The survey contains 19 questions, which address parent experiences with Parent Portal. These questions can be further broken down into two subcategories, as five questions address parent-to-school communication and 14 address parent-to-student communication. Research Question 1 is concerned with parent-to-school communication and can be answered by five of the survey questions.

Table 6

Survey Questions Frequencies Model 1

Survey Question	N	Strongly Disagree	Disagree	Agree	Strongly Agree	No Response
1.School to home communication is important to my child's success	49	0	0	9(18.4%)	40(81.6%)	0
2.Access improved communication with teacher	49	1 (2%)	12(24.5%)	18(36.7%)	18(36.7%)	0
3. Access improved communication with administration	49	3(6.1%)	19(38.8%)	16(32.7%)	11(22.4%)	0
4. Information prompted conversation with an administrator	46	2(4.1%)	27(55.1%)	14(28.6%)	3(6.1%)	3 (6.1%)
5. Access prompted conversation with teacher*	49	3(6.1%)	13(26.5%)	23(46.9%)	10(20.4%)	0
6. Total parent to school communication	49					

Table 7

Descriptive Statistics and Chi Squares Model 1

Survey Question	N	Mean	Median	Std. Deviation
1.School to home communication is important to my child's success*	49	3.8163	4.0000	.39123
2.Access improved communication with teacher*	49	3.0816	3.0000	.83757

3. Access improved communication with administration*	49	2.7143	3.0000	.88967
4. Information prompted conversation with an administrator*	46	2.3913	2.0000	.68242
5. Access prompted conversation with teacher*	49	2.8163	3.0000	.83350
6. Total parent to school communication*	49	14.6735	15.0000	

*1: χ^2 =19.612, *df*=1, *p* <.001
*2: χ^2 =15.735, *df*=3, *p*<.001
*3: χ^2 =11.980, *df*=3, *p*<.05
*4: χ^2 =35.565, *df*=3, *p*<.001
*5: χ^2 =16.878, *df*=3, *p*<.001
*6: χ^2 =21.776, *df*=11, *p*<.05

Table 8

Chi Square Test Frequencies Model 1

School-to-home communication is important to my child's success.

	Observed *N*	Expected *N*	Residual	Standardized Residual
Agree	9	24.5	-15.5	-3.13
Strongly Agree	40	24.5	15.5	3.13
Total	49			

Access to Parent Portal has improved my communication with my child's teacher

	Observed *N*	Expected *N*	Residual	Standardized Residual
Strongly Disagree	1	12.3	-11.3	-3.22
Disagree	12	12.3	-.3	-0.02
Agree	18	12.3	5.8	1.65
Strongly Agree	18	12.3	5.8	1.65
Total	49			

Access to Parent Portal has improved my communication with the administration at my child's school

	Observed *N*	Expected *N*	Residual	Standardized Residual
Strongly Disagree	3	12.3	-9.3	-2.65
Disagree	19	12.3	6.8	1.94
Agree	16	12.3	3.8	1.08
Strongly Agree	11	12.3	-1.3	0.37
Total	49			

The information regarding my child in Parent Portal has prompted a conversation with an administrator at my child's school.

	Observed *N*	Expected *N*	Residual	Standardized Residual
Strongly Disagree	2	11.5	-9.5	-2.80
Disagree	27	11.5	15.5	4.57
Agree	14	11.5	2.5	0.70
Strongly Agree	3	11.5	-8.5	-2.50
Total	46			

The information regarding my child in Parent Portal has prompted a conversation with my child's teacher.

	Observed *N*	Expected *N*	Residual	Standardized Residual
Strongly Disagree	3	12.3	-9.3	-2.64
Disagree	13	12.3	.8	0.23
Agree	23	12.3	10.8	3.07
Strongly Agree	10	12.3	-2.3	-0.65
Total	49			

It is reported in the above frequencies tables that all 49 respondents either agree (18.4%) or strongly agree (81.6%) that parent-to-home communication is important to their child's success. A total of 73.4 % of the respondents reported that they agree (36.7%) or strongly agree (36.7%) that access to Parent Portal improved their communication with their child's teacher, while 26.5% either disagreed (24.5%) or strongly disagreed (2%) that access to the

portal improved communication with their child's teacher. When asked if access to Parent Portal improved their communication with their child's administration, a total of 55.1% agreed or strongly agreed with this statement.

When asked if access to the portal prompted conversations with their child's teacher, a total of 67.3% of respondents agreed (46.9%) or strongly agreed (20.4%) with this statement. Parents were also asked if access to the portal prompted a conversation with an administrator, a total of 34.7% of respondents agreed (28.6%) or strongly agreed (6.1%) with this statement, while a total of 59.2% of respondents disagreed (51.1%) or strongly disagreed (4.1%).

Chi square analysis was conducted to determine if there was a significant difference between expected and observed responses to the survey questions or if the differences between frequencies were attributed to chance. The Chi square goodness of fit test shows that for Research Question 1, all five survey questions were statistically significant.

The responses to the question "School-to-home communication is important to my child's success" (χ^2 =19.612, *df* =1, *p* <.001) were statistically significant, which demonstrates a statistically significant difference in responses. Both *strongly agree* and *agree* contributed to the significance due to the size of the standardized residual, which was 3.13. Hinkle, Wiersama, and Jurs (2009) posit that a standardized residual value of >2 identifies those Chi-square categories that are contributing to the significant statistic. The responses to the question "Access to Parent Portal has improved my communication with my child's teacher" were also statistically significant (χ^2 =15.735, *df* =3, *p* <.001), which demonstrates a significant difference in responses. The response *strongly disagree* contributed the most to the significance, with a standardized residual value of 3.22. The responses to the question "Access to Parent Portal has improved my communication with the administration at my child's school" are also statistically

significant (χ^2 =11.980, *df* =3, *p* <.05), with the response choice *strongly disagree* contributing most to the significance with a standardized residual value of 2.65. In this case it was significant because only one person responded *strongly disagree*. The responses to the question "The information regarding my child in Parent Portal has prompted a conversation with the administrator at my child's school" (χ^2 = 35.565, *df* =3, *p* <.001) are also statistically significant. There was a significant difference between responses, with *strongly disagree*, *disagree*, and *strongly agree*, contributing the most to the overall significance with standardized residual values of -2.80, 4.57 and -2.50, respectively. The responses to the question "The information regarding my child in Parent Portal has prompted a conversation with my child's teacher" (χ^2 =16.878, *df* =3, *p* <.001) are also statistically significant, with the responses *strongly disagree* and *agree* making the most contribution to the significance with standardized residual values of –2.64 and 3.07, respectively.

Research Question 2 – Analysis and Results

What evidence, if any, exists that suggests access to and the use of Parent Portal improves parent/student communication?

Research Question 2 is concerned with parent-student communication and can be answered by 14 of the 19 survey questions, which directly address parent communication with their student.

Table 9

Survey Question Frequencies Model 2

Survey Question	*N*	Strongly Disagree	Disagree	Agree	Strongly Agree	No Response
1. Knowledge of assignments	49	1 (2%)	5(10.2%)	18(36.7%)	25(51%)	0

2. Knowledge of assessments	49	1 (2%)	4 (8.2%)	18(36.1%)	26(53.1%)	0
3. Monitoring homework/ study time	49	1 (2%)	3(6%)	13(26.1%)	29(59.2%)	0
4. Use of rewards	49	1 (2%)	10(20.4%)	21(42.9%)	13(26.5%)	0
5. Use of discipline	49	5(10.2%)	10(20.4%)	22(44.9%)	12(24.5%)	0
6.Conversations about assignments	49	1(2%)	1 (2%)	20(40.8%)	26(53.1%)	0
7.Conversations about assessments	49	1 (2%)	2(4.1%)	13(26.5%)	29(59.2%)	0
8. Future plans	47	1(2%)	12(24.5%)	18(36.7%)	16(32.7%)	2 (4.1%)
9. Grades	47	1(2%)	9(18.4%)	20(40.8%)	17(34.7%)	2 (4.1%)
10.Attendance	46	4(8.2%)	24(49.0%)	16(32.7%)	2(4.1%)	3 (6.1%)
11. Info on grades	47	0(0%)	0(0%)	15(30.6%)	32(65.3%)	2 (4.1%)
12. Info on assignments	48	0(0%)	10(20.4%)	19(38.8%)	19(38.8%)	1 (2.1%)
13. Info on attendance	47	3(6.1%)	26(53.1%)	14(28.6%)	4(8.2%)	2 (4.1%)
14. Prompted conversation with my child	47	1(2%)	0(0%)	23(46.9%)	23(46.9%)	2 (4.1%)
15. Total Parent/student communication	49					

Table 10

Survey Questions Descriptive Statistics and Chi Squares Model 2

Survey Question	*N*	Mean	Median	Std. Deviation
1. Knowledge of assignments*	49	3.3673	4.0000	.75537
2. Knowledge of assessments*	49	3.3878	4.0000	.81180
3. Monitoring homework/ study time*	49	3.3061	4.0000	1.10310

4. Use of rewards*	49	2.7755	3.0000	1.12297
5. Use of discipline*	49	2.8367	3.0000	.92075
6.Conversations about assignments*	49	3.4082	4.0000	.81441
7.Conversations about assessments*	49	3.2653	4.0000	1.18630
8. Future plans*	47	3.0426	3.0000	.83295
9. Grades*	47	3.1277	3.0000	.79720
10.Attendance*	46	2.3478	2.0000	.70608
11. Info on grades*	47	3.6809	4.0000	.47119
12. Info on assignments	48	3.1875	3.0000	.76231
13. Info on attendance*	47	2.4043	2.0000	.74190
14. Prompted conversation with my child*	47	3.4468	3.0000	.61885
15. Total parent/student communication	49	42.5714	43.0000	7.98436

*1: χ^2 =30.592, *df*=3, *p*<.001
*2: χ^2 =34.020, *df*=3, *p*<.001
*3: χ^2= 56.000, *df*=4, *p*<.001
*4: χ^2=25.184, *df*=4, *p*<.001
*5: χ^2 =12.469, *df*=3, *p*<.001
*6: χ^2= 61.102, *df*=4, *p*<.001
*7: χ^2 = 56.204, *df*=4, *p*<.001
*8: χ^2 = 14.702, *df*=3, p<.002
*9: χ^2 =18.617, *df*=3, *p*<.001
*10: χ^2 =28.087, *df*=3, *p*<.001
*11: χ^2 =6.149, *df*=1, *p*<.05
*13: χ^2 =29.340, *df*=3, *p*<.001
*14: χ^2 =20.596, *df*=2, *p*<.001

Table 11

Chi-Square Test Frequencies

Access to Parent Portal has improved my knowledge of assignments being provided by my child's teacher.

	Observed *N*	Expected *N*	Residual	Standardized Residual
Strongly Disagree	1	12.3	-11.3	-3.21
Disagree	5	12.3	-7.3	-2.07

Agree	18	12.3	5.8	1.65
Strongly Agree	25	12.3	12.8	3.64
Total	49			

Access to Parent Portal has improved my knowledge of tests, quizzes and other assessments my child is taking.

	Observed *N*	Expected *N*	Residual	Standardized Residual
.00	1	12.3	-11.3	-3.21
Disagree	4	12.3	-8.3	-2.58
Agree	18	12.3	5.8	1.65
Strongly Agree	26	12.3	13.8	3.93
Total	49			

Access to Parent Portal has influenced how I support my child at home through monitoring homework/study time.

	Observed *N*	Expected *N*	Residual	Standardized Residual
.00	3	9.8	-6.8	-2.17
Strongly Disagree	1	9.8	-8.8	-2.17
Disagree	3	9.8	-6.8	-2.17
Agree	13	9.8	3.2	1.02
Strongly Agree	29	9.8	19.2	6.13
Total	49			

Access to Parent Portal has influenced how I support my child at home through the use of rewards or privileges.

	Observed *N*	Expected *N*	Residual	Standardized Residual
.00	4	9.8	-5.8	-1.85
Strongly Disagree	1	9.8	-8.8	-2.81
Disagree	10	9.8	.2	0.06
Agree	21	9.8	11.2	3.58
Strongly Agree	13	9.8	3.2	1.02
Total	49			

Access to Parent Portal has influenced how I support my child at home through the use of discipline.

	Observed *N*	Expected *N*	Residual	Standardized Residual
Strongly Disagree	5	12.3	-7.3	-2.07
Disagree	10	12.3	-2.3	-0.65
Agree	22	12.3	9.8	2.79
Strongly Agree	12	12.3	-.3	-0.09
Total	49			

Access to Parent Portal has prompted conversations with my child regarding his or her assignments.

	Observed *N*	Expected *N*	Residual	Standardized Residual
.00	1	9.8	-8.8	-2.81
Strongly Disagree	1	9.8	-8.8	-2.81
Disagree	1	9.8	-8.8	-2.81
Agree	20	9.8	10.2	3.26
Strongly Agree	26	9.8	16.2	5.17
Total	49			

Access to Parent Portal has prompted conversations with my child regarding his or her test/quizzes and other assignments.

	Observed N	Expected N	Residual	Standardized Residual
.00	4	9.8	-5.8	-1.85
Strongly Disagree	1	9.8	-8.8	-2.81
Disagree	2	9.8	-7.8	-2.49
Agree	13	9.8	3.2	1.00
Strongly Agree	29	9.8	19.2	6.13
Total	49			

Access to Parent Portal has prompted conversations with my child regarding his or her future plans.

	Observed *N*	Expected *N*	Residual	Standardized Residual
Strongly Disagree	1	11.8	-10.8	-3.13
Disagree	12	11.8	.3	.0009
Agree	18	11.8	6.3	1.83
Strongly Agree	16	11.8	4.3	1.25

Total	47

Access to Parent Portal has influenced my child's grades.

	Observed *N*	Expected *N*	Residual	Standardized Residual
Strongly Disagree	1	11.8	-10.8	-3.13
Disagree	9	11.8	-2.8	-0.81
Agree	20	11.8	8.3	2.41
Strongly Agree	17	11.8	5.3	1.54
Total	47			

Access to Parent Portal has had an influence on my child's attendance.

	Observed *N*	Expected *N*	Residual	Standardized Residual
Strongly Disagree	4	11.5	-7.5	-2.21
Disagree	24	11.5	12.5	3.69
Agree	16	11.5	4.5	1.32
Strongly Agree	2	11.5	-9.5	-2.80
Total	46			

When accessing Parent Portal, I am looking for information regarding grades.

	Observed *N*	Expected *N*	Residual	Standardized Residual
Agree	15	23.5	-8.5	-1.75
Strongly Agree	32	23.5	8.5	1.75
Total	47			

When accessing Parent Portal, I am looking for information regarding attendance.

	Observed *N*	Expected *N*	Residual	Standardized Residual
Strongly Disagree	3	11.8	-8.8	2.56
Disagree	26	11.8	14.3	4.16
Agree	14	11.8	2.3	0.67
Strongly Agree	4	11.8	-7.8	2.26

Total	47			

The information regarding my child in Parent Portal has prompted a conversation with my child.

	Observed *N*	Expected *N*	Residual	Standardized Residual
Strongly Disagree	1	15.7	-14.7	-3.71
Agree	23	15.7	7.3	1.84
Strongly Agree	23	15.7	7.3	1.84
Total	47			

Parents reported that overall Parent Portal access improved their knowledge of their child's assignments and assessments. A total of 87.7% of parents agreed or strongly agreed that access to the portal improved their knowledge of assignments, while a total of 89.2% agreed or strongly agreed that access to the portal improved their knowledge of assessments such as tests and quizzes. A total of 93.8% of parents agreed that access to the portal prompted a conversation with their child. A total of 69.4% of parents agreed or strongly agreed that access to the portal prompted a conversation with their child regarding their future plans. A total of 93.9% of parents agreed or strongly agreed that access to the portal prompted a conversation with their child about their assignments, while a total of 85.7% agreed or strongly agreed that access to the portal prompted a conversation about their child's assessments such as tests and quizzes.

A total of 75.5% of parents agreed or strongly agreed that access to Parent Portal had an influence on their child's grades, while only 36.8% agreed or strongly agreed that it had an influence on their child's attendance. When asked to respond to questions regarding Parent Portal access and its influence on behaviors at home, a total of 85.3% of parents agreed or strongly agreed that access influenced how they monitor study and homework time. A total of 69.4% of

parents agreed or strongly agreed that access to the portal influenced their use of rewards and discipline at home.

Finally, when asked what type of information they were seeking when accessing the portal, 100% of the 47 respondents, (two chose not to respond) agreed or strongly agreed that they were seeking information regarding grades. A total of 77.6% of the 48 parents who responded agreed or strongly agreed that they were seeking information regarding assignments. Finally, a total of 36.8% of the 47 parents who responded agreed or strongly agreed that they were seeking information regarding attendance.

Chi-square analysis was conducted to determine if there was a significant difference between expected and observed responses to the survey questions or if the differences between frequencies were attributed to chance. The complete chi-square frequencies tables can be found in Appendix A. Thirteen of the fourteen questions asked were determined to have a significant difference in responses as opposed to responses being attributed to chance.

The responses to the question "Access to Parent Portal has improved my knowledge of assignments being provided by my child's teacher" were statistically significant ($\chi^2 = 30.592$, $df = 3$, $p < .001$) with *strongly disagree*, *disagree*, and *strongly agree* contributing most to the significance with residual values of –3.21, –2.07 and 3.64, respectively. The responses to the question "Access to Parent Portal has improved my knowledge of tests, quizzes and other assessments my child is taking" were statistically significant ($\chi^2 = 34.020$, $df = 3$, $p < .001$) with *no response*, *disagree*, and *strongly agree* contributing most to the significance with residual values of –3.21, –2.58 and 3.93, respectively.

The responses to the question "Access to Parent Portal has influenced how I support my child at home through monitoring homework/study time" were statistically significant (χ^2

=56.000, *df* =4, *p* <.001) with *no response*, *strongly disagree*, and *disagree* contributing to the significance with the same standardized residual value of –2.17, along with *strongly agree,* with a standardized residual value of 6.13. The responses to the question "Access to Parent Portal has influenced how I support my child at home through the use of rewards or privileges" were statistically significant (χ^2 = 25.184, *df* = 4, *p* <.001) with *strongly disagree* and *agree* contributing most to the significance with standardized residual values of –2.81 and 3.58, respectively. The responses to the question "Access to Parent Portal has influenced how I support my child at home through the use of discipline" were statistically significant (χ^2 =12.469, *df* = 3, *p* <.001), with *strongly disagree* and *agree* contributing most to the significance with a standardized residual value of –2.07 and 2.79, respectively.

The responses to the question "Access to Parent Portal has prompted conversations with my child regarding his or her assignments" were statistically significant (χ^2 = 61.102, *df* = 4, *p* <.001), illustrating that the survey responses were statistically different; all responses contributed to the significance with a residual value higher than the critical value of 2 as follows: *no response* (2.81), *strongly disagree* (2.81), *disagree* (2.81), *agree* (3.26) and *strongly agree* (5.17). The responses to the question "Access to Parent Portal has prompted conversations with my child regarding his or her tests, quizzes, and other assignments" were statistically significant (χ^2 = 56.204, *df* = 4, *p* <.001), illustrating that the survey responses were statistically different; *strongly disagree*, *disagree*, and *strongly agree* contributed the most to the significance with standardized residual values of -2.81, -2.49 and 6.10, respectively. The responses to the question "Access to Parent Portal has prompted conversations with my child regarding his or her future plans" were statistically significant (χ^2 = 14.702, *df* = 3, *p* <.05), illustrating that the survey responses were statistically different; *strongly disagree* contributed the most to the significance

with a standardized residual value of –3.13. In this case it was significant because only one person responded *strongly disagree*.

The responses to the question "Access to Parent Portal has influenced my child's grades" were statistically different from one another and statistically significant (χ^2 =18.617, *df* =3, *p* <.001); the responses *strongly disagree* (–3.13) and *agree* (1.83) contributed the most to the significance, with a standardized residual value higher than two. The responses to the question "Access to Parent Portal has had an influence on my child's attendance were statistically different and statistically significant (χ^2 = 28.087, *df* = 3, *p* <.001); the responses *strongly disagree* (–2.21), *disagree* (3.69) and *strongly agree* contributed to the significance with standardized residual values greater than two.

The responses to the question "When accessing Parent Portal, I am looking for information regarding grades" were statistically significant (χ^2 = 6.149, *df* =1, *p* <.05) and statistically different, as the distribution of frequencies was not attributed to chance. The responses *strongly agree* and *agree* contributed to the significance, with standardized residual values greater than two. The responses to the question "When accessing Parent Portal, I am looking for information regarding attendance" were statistically significant (χ^2 = 29.340, *df* =3, *p* <.001) and statistically different, as the distribution of frequencies were not attributed to chance. The responses *strongly disagree* (2.56), *disagree* (4.16) and *strongly agree* (2.26) contributed to the significance with a standardized residual value greater than two. The responses to the question "The information regarding my child in Parent Portal has prompted a conversation with my child" were statistically significant (χ^2 = 20.596, *df* = 2, *p* <.001) and statistically different, as the distribution of frequencies was not attributed to chance. The response *strongly disagree* contributed most to the significance, with a standardized residual

value of –3.71. Again, in this case it was significant because only one person responded *strongly disagree.*

Data Collection: Research Questions 3, 4, 5, and 6

The data were collected with permission from the superintendent of schools in the district after approval and adhering to the guidelines of the Seton Hall University IRB. The district Coordinator of Technology gathered data and provided the data to me on an Excel spreadsheet. Student ID numbers were used to organize the student data in an effort to maintain anonymity and confidentiality. Each data set contained information on ethnicity, gender, attendance, school attending, eligibility for free and reduced lunch, special education classification, number of parent logins, Grade 6 GPA, NJ ASK 6 LAL and Math scores and NJ ASK 5 LAL and Math scores.

This study contained samples from two middle schools housing Grades 4-8 in a suburban area of New Jersey. SPSS Version 21 was used to house, identify, and analyze data. Regression analysis was used to analyze the dependent variables GPA, NJ ASK 6 LAL, NJ ASK 6 Math and attendance while controlling for school and student variables.

Variables

The independent variables included gender, ethnicity, free and reduced lunch status, attendance, parent logins, logins square root, and NJ ASK scores in both Language Arts Literacy and Mathematics for the 2011-2012 and 2012-2013 school years. The dependent variables were NJ ASK scores in Language Arts Literacy and Math for the 2012-2013 school year and sixth grade GPA.

The variable parent logins was statistically positively skewed due to outliers and was largely different than a normal distribution as there was no peakedness (Hinkle et al., 2003). According to Hinkle et al., 2003, skewness is defined as follows:

> the degree to which the majority of scores on a frequency distribution are located at one end of the scale of measurements with progressively fewer scores toward the opposite end of the scale (p. 739).

The variable was coded by assigning the number of times a parent logged into Parent Portal to the student's data with a minimum value of 0 and a maximum value of 590. The variable required transformation due to its distribution and skewness. The variable was transformed in SPSS using the square root transformation method, as there were no values less than zero or between 0.00 and 1.00. The square root of each value was determined to return the variable to the assumption of normality. Table 12 highlights the descriptive statistics before the transformation. Table 13 highlights the descriptive statistics for logins (login square root) after the transformation.

Table 12

			Statistic	Std. Error
Logins	Mean		86.5222	7.56043
	95% Confidence Interval for Mean	Lower Bound	71.6032	
		Upper Bound	101.4413	
	5% Trimmed Mean		72.7963	
	Median		58.5000	
	Variance		10288.821	
	Std. Deviation		101.43382	
	Minimum		.00	
	Maximum		590.00	
	Range		590.00	
	Interquartile Range		107.00	

	Skewness	2.404	.181
	Kurtosis	7.418	.360

Table 13

Descriptive Statistics Login Square Root

N	Valid	180
	Missing	0
Mean		7.8327
Std. Error of Mean		.37499
Median		7.6485
Mode		.00
Std. Deviation		5.03106
Variance		25.312
Skewness		.630
Std. Error of Skewness		.181
Kurtosis		.544
Std. Error of Kurtosis		.360
Range		24.29
Minimum		.00
Maximum		24.29
Percentiles	25	4.3000
	50	7.6485
	75	11.2026

Table 14

Explore Table Logins

			Case Number	Value
Logins	Highest	1	19	590.00
		2	61	542.00
		3	140	528.00
		4	73	432.00
		5	111	419.00
	Lowest	1	162	.00

	2	154	.00
	3	149	.00
	4	144	.00
	5	129	.00[a]

a. Only a partial list of cases with the value .00 are shown in the table of lower extremes.

Table 15 contains the explanation for the way in which the variables were coded in SPSS. Table 16 contains the descriptive statistics for all variables, and Table 17 lists the variable frequencies.

Table 15

SPSS Variable Coding

Variables	Measure	Coding
School Attended	Nominal	0=A 1=B
Gender	Nominal	0=Male 1=Female
Hispanic	Nominal	0=Hispanic 1=Non Hispanic
Asian	Nominal	0=Asian 1=Non Asian
Other	Nominal	0=Other 1=Non other
Ethnicity Dichotomous	Nominal	0=White 1=Non white
Free and Reduced Lunch	Nominal	0=Not FRL 1=FRL
NJ ASK 5 LAL	Scale	Scores Indicated
NJ ASK 5 Math	Scale	Scores Indicated
NJ ASK 6 LAL	Scale	Scores Indicated
NJ ASK 6 Math	Scale	Scores Indicated
GPA	Scale	Scores Indicated

Attendance	Scale	Day Absent Indicated
Logins	Scale	Number of Logins Indicated
Logins Square Root	Scale	None Transformed Scale Value

Table 16

Descriptive Statistics for Variables

	N	Minimum	Maximum	Mean	Std. Deviation
School	180	.00	1.00	.4722	.50062
Gender	180	.00	1.00	.5333	.50028
Hispanic	180	.00	1.00	.1500	.35807
Asian	180	.00	1.00	.1500	.35807
Other	180	.00	1.00	.0611	.24020
Ethnicity Dichotomus	180	.00	1.00	.6389	.48166
Free Reduced Lunch	180	.00	2.00	.0667	.34414
NJ ASK 5 LAL	159	.00	266.00	214.2956	27.89323
NJ ASK 5 Math	160	168.00	300.00	243.4250	30.44751
NJ ASK 6 LAL	179	154.00	288.00	220.7989	18.72881
NJ ASK 6 Math	180	164.00	300.00	235.6333	31.01034
Attendance	180	.00	17.00	5.5722	4.13735
GPA	180	1.61	4.26	3.5066	.51917
Logins	180	.00	590.00	86.5222	101.43382
Login_Sqrt	180	.00	24.29	7.8327	5.03106
Valid *N* (listwise)	159				

Table 17

Variable Frequencies

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	84	46.7	46.7	46.7
	Female	96	53.3	53.3	100.0

	Total	180	100.0	100.0	

Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non-Other	169	93.9	93.9	93.9
	Other	11	6.1	6.1	100.0
	Total	180	100.0	100.0	

Hispanic

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non-Hispanic	153	85.0	85.0	85.0
	Hispanic	27	15.0	15.0	100.0
	Total	180	100.0	100.0	

Asian

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non-Asian	153	85.0	85.0	85.0
	Asian	27	15.0	15.0	100.0
	Total	180	100.0	100.0	

Free Reduced Lunch

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not on FRL	173	96.1	96.1	96.1
	On FRL	2	1.1	1.1	97.2
	2.00	5	2.8	2.8	100.0
	Total	180	100.0	100.0	

Chi-Square

I ran chi-square analysis to determine if the samples from the two schools could be

analyzed as a whole or would need to be analyzed as two separate samples because they contained statistically significant differences. To test for significant differences in nominal data, which have no rank or order, chi-square was utilized. Ethnicity and free and reduced lunch were not significantly different between schools. Ethnicity ($x^2 = 4.276$, $df = 4$, $p < .370$) is insignificant, with <.370. Free and reduced lunch ($x^2 = 2.789$, $df = 2$, $p = .248$) was also insignificant with a p value of .248. Gender, however, was deemed significant ($x^2 = 4.634$, $df = 1$, $p = \geq .05$), as the $p < .05$. I decided to keep the sample whole, as I could control for gender through the proper analytic procedures such as multiple regression, backward entry method.

After initial exploratory simultaneous regression analyses of the variables were conducted, it became clear that employing the backward variable loading method when running regression analysis in SPSS would be the best way to analyze the data. Often simultaneous regression is referred to as the "garbage can" method, where each independent variable is analyzed to find the highest possible multiple correlations of these variables with the dependent variable. When all variables are run simultaneously, all variables are considered in SPSS at the same time (Leech et al., 2011). As I was attempting to determine which variables would create the best prediction equation, simultaneous regression was the place to begin. However, due to the large number of variables being run in the model, it became clear that backward regression, where each variable is considered while removing the variables one at a time until the final model explains the most significant variance, seemed to be the best method (Leech et al., 2011). The overall goal was to primarily identify those specific predictor variables that significantly contributed to explaining the most amount of variance for the dependent/outcome variables and not necessarily to identify a "best fit" model.

Research Question 3 – Analysis and Results

What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by GPA when controlling for gender, attendance, free and reduced lunch status, and ethnicity?

Model A – GPA.

The GPA regression model with backward entry method was used to determine the amount of variance in the dependent variable GPA that could be explained by gender, free and reduced lunch status, attendance, ethnicity classification of Asian, Hispanic, Black, or multiracial (Other) and parent logins. Table 18 reports the descriptive statistics for the outcome variable GPA and predictor variables listed above.

Table 18

Descriptive Statistics Model A- GPA Regression Analysis

	Mean	Std. Deviation	*N*
GPA	3.5066	.51917	180
Gender	.5333	.50028	180
Free Reduced Lunch	.0667	.34414	180
Attendance	5.5722	4.13735	180
Asian	.1500	.35807	180
Hispanic	.1500	.35807	180
Other	.0611	.24020	180
login_sqrt	7.8327	5.03106	180

The correlations table for the GPA regression model (see Appendix A) was reviewed to determine the relationships between the dependent variable and one or more of the independent variables. The Pearson correlation revealed that free and reduced lunch, attendance, Hispanic, and Other were negatively correlated with GPA while gender, Asian, and login square root were positively correlated with GPA.

Table 19

Model A Summary – GPA

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	.473[a]	.224	.193	.46652	.224	7.097	7	172	.000	
2	.473[b]	.224	.197	.46519	.000	.014	1	172	.907	
3	.470[c]	.221	.199	.46478	-.003	.692	1	173	.407	2.115

a. Predictors: (Constant), login_sqrt, Free Reduced Lunch, Other, Asian, Hispanic, Gender, Attendance

b. Predictors: (Constant), login_sqrt, Free Reduced Lunch, Other, Hispanic, Gender, Attendance

c. Predictors: (Constant), login_sqrt, Other, Hispanic, Gender, Attendance

The R^2 for GPA regression Model A, Model 3 indicates that 22.1% of the variance in student GPA can be explained by login square root, Other, Hispanic, gender, and attendance, while the adjusted R^2 reports 19.9 % of the variance if applied to the entire population from which the sample was drawn. This regression model is statistically significant (F=.9.869, df =5,174, p <.001) (see Table 20). The Durbin-Watson of 2.115 falls between the acceptable value of 1-4 and therefore there is no autocorrelation between residuals.

Table 20

ANOVA Table for Model A- GPA

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
3	Regression	10.660	5	2.132	9.869	.000[d]
	Residual	37.587	174	.216		
	Total	48.247	179			

a. Dependent Variable: GPA

b. Predictors: (Constant), login_sqrt, Other, Hispanic, Gender, Attendance

Examination of the coefficients table (Table 21) shows that there are five statistically significant predictors of GPA in Model 3, login square root, Other, Hispanic, gender, and attendance. See Appendix B for the complete coefficient table iterations created in the backwards design entry method. With the tolerance values being greater that 1-R^2 (.779), multicollinearity was not a problem. Additionally, all reported variance inflation factors (VIFs) were less than 2.

Table 21

Coefficients for Model A- GPA

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
3	(Constant)	3.523	.098		35.88	.000					
	Gender	.241	.072	.232	3.351	.001	.200	.246	.224	.934	1.071
	Attendance	-.035	.009	-.277	-4.024	.000	-.293	-.292	-.269	.944	1.059
	Hispanic	-.222	.100	-.153	-2.218	.028	-.202	-.166	-.148	.939	1.065
	Other	-.458	.147	-.212	-3.121	.002	-.209	-.230	-.209	.972	1.029
	login_sqrt	.014	.007	.136	1.964	.051	.134	.147	.131	.932	1.073

a. Dependent Variable: GPA

The predictor variable gender has a positive and significant influence on GPA (β = .232, t = 3.351, p <.05), explaining 5.4% of the total variance in the model. The positive beta of .232 indicates a positive and moderately weak relationship between gender and GPA, as the closer the beta is to 1, the stronger the relationship. Specifically, because of the dummy coding of 0=males and 1=females, females are outperforming their male peers when it comes to GPA.

The predictor variable attendance has a negative and statistically significant influence on the outcome variable GPA (β = .277, t = 4.024, p <.05 , explaining 7.7% of the total variance in the model. This indicates that the more times a student is absent, the lower the GPA. With a beta of –.277, this is a moderately weak relationship. The independent variable Hispanic also has a negative and statistically significant influence on the dependent variable GPA (β = –.153, t = –2.218, p <.05), explaining 2.3% of the total variance of the model. This indicates that a student's ethnicity as Hispanic has a negative impact on his or her GPA. An ethnic classification of Other (Black or multiracial) is also a negative and statistically significant influence on GPA (β = –.212, t = 3.121, p <.05), explaining the total variance in the model. Essentially, an ethnic classification of Other indicates that much like a classification of Hispanic, it has a negative impact on GPA.

Finally, login square root or the number of times a parent logged into Parent Portal had a positive and marginally significant influence on GPA (ß = .136, t =1.964, p < .051), explaining 1.8% of the total variance in the model. A positive beta of .136 indicates a positive but weak relationship between parent logins and GPA. This indicates that the more times a parent logs into Parent Portal, the higher a student's GPA will be.

Model B – GPA regression model.

In the Model B regression analysis, backward entry method was performed to determine the variability in the dependent variable GPA that can be explained by the independent variables gender, free and reduced lunch, attendance, Asian, Other, login square root, NJ ASK 5 Math and NJ ASK 5 Language Arts Literacy. Table 22 provides the descriptive statistics for all the variables utilized in the model.

Table 22

Descriptive Statistics for Model B-GPA Regression Analysis

	Mean	Std. Deviation	*N*
GPA	3.5213	.51441	159
Gender	.5597	.49799	159
Free Reduced Lunch	.0440	.28342	159
Attendance	5.7013	4.13120	159
Asian	.1447	.35286	159
Hispanic	.1258	.33266	159
Other	.0503	.21928	159
login_sqrt	7.8323	5.15030	159
NJ ASK 5 Math	243.5597	30.49582	159
NJ ASK 5 LAL	214.2956	27.89323	159

A correlation table (Appendix A) was reviewed to determine relationships between the dependent variable and one or more independent variables. A positive relationship exists between GPA and gender, Asian, login square root, NJ ASK 5 Math, and NJ ASK 5 LAL. Asian was the only positively correlated relationship to GPA that was not statistically significant, while gender, login square root, NJ ASK 5 Math, and NJ ASK 5 LAL were all statistically significant. Free and reduced lunch, attendance, Hispanic, and Other were all negatively correlated with GPA at statistically significant levels.

Table 23

Model B Summary- GPA

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	.757[a]	.573	.547	.34629	.573	22.183	9	149	.000	

2	.756[b]	.572	.549	.34533	.000	.162	1	149	.688	
3	.754[c]	.569	.549	.34551	-.003	1.159	1	150	.283	
4	.750[d]	.563	.546	.34669	-.006	2.040	1	151	.155	2.226

a. Predictors: (Constant), NJASK 5 LAL, login_sqrt, Free Reduced Lunch, Asian, Other, Hispanic, Attendance, Gender, NJASK 5 Math

b. Predictors: (Constant), NJASK 5 LAL, login_sqrt, Free Reduced Lunch, Other, Hispanic, Attendance, Gender, NJASK 5 Math

c. Predictors: (Constant), NJASK 5 LAL, login_sqrt, Free Reduced Lunch, Other, Attendance, Gender, NJASK 5 Math

d. Predictors: (Constant), NJASK 5 LAL, login_sqrt, Other, Attendance, Gender, NJASK 5 Math

e. Dependent Variable: GPA

The R^2 in the fourth model indicates that 56.3% of the variance in student performance as measured by GPA for the sample population can be explained by the fourth model, which includes the variables NJ ASK 5 LAL, login square root, Other, attendance, gender, and NJ ASK 5 Math. The adjusted R^2 value reveals that the fourth model, if applied to the entire population can explain 54.6% of the variance. This regression model (Table 24) is statistically significant, with $F = 36.642$, $df = 6,152$, $p < .05$. The Durbin-Watson of 2.226 falls between the acceptable value of 1-4, and therefore there is no autocorrelation between residuals.

Table 24

ANOVA Table for Model B- GPA

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
4	Regression	23.540	6	3.923	32.642	.000[e]
	Residual	18.269	152	.120		
	Total	41.810	158			

a. Dependent Variable: GPA

b. Predictors: (Constant), NJASK 5 LAL, login_sqrt, Other, Attendance, Gender, NJASK 5 Math

Examination of the standardized coefficient table (Table 25) reveals that there are five statistically significant variables: gender, attendance, login square root, NJ ASK 5 Math and NJ

ASK 5 LAL. See Appendix B for the complete coefficient table iterations created in the backwards design entry method. Multicollinearity was not an issue, as the tolerance for each variable in the model was greater than .437 (<1–R^s); additionally, all reported variance inflation factors (VIFs) were less than 2.

Table 25

Coefficients Table for Model B- GPA

Model	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	.403	.280		1.437	.153					
Gender	.205	.060	.199	3.440	.001	.181	.269	.184	.861	1.161
Attendance	-.020	.007	-.161	-2.859	.005	-.305	-.226	-.153	.903	1.107
Other	-.214	.127	-.091	-1.681	.095	-.155	-.135	-.090	.979	1.022
login_sqrt	.014	.006	.145	2.590	.011	.129	.206	.139	.918	1.089
NJASK 5 Math	.008	.001	.470	7.400	.000	.632	.515	.397	.712	1.405
NJASK 5 LAL	.005	.001	.274	4.365	.000	.539	.334	.234	.729	1.371

a. Dependent Variable: GPA

The predictor of gender on student performance as defined by GPA has a positive and significant influence (β =.199, t = 3.440, p <.05), explaining 3.9% of the total variance in the fourth model due to a beta value of .199; gender proves to be a moderately weak predictor, as it is close to 1. Also, due to dummy coding with 1=female and 0=male, it can be determined that females are outperforming their male peers in terms of gender.

The predictor variable of attendance has a negative and significant influence on GPA

(β = –.161, t = –2.859, p <.05), explaining 2.5% of the total variance in the model. Due to the negative beta, the higher a student's absences, the lower his or her GPA score will be. Login square root has a positive and significant influence on GPA (β = .145, t = 2.590, p <.001), explaining 2.1% of the total variance in the model. This variable is positive, which indicates that the more times a parent logs in to Parent Portal, the higher the student GPA will be. This can also be considered a weak influence due to the beta value.

NJASK 5 Math has a positive and significant influence on GPA (β = .470, t = 7.400, p <.001), explaining 22% of the total variance in the model. The beta of .470 indicates a moderate relationship between NJ ASK 5 Math and GPA. The higher a student's score on NJ ASK 5 Math, the higher the student's GPA. NJ ASK 5 Language Arts Literacy is also a positive and significant influence on GPA (β = .274, t = 4.365, p <.001), explaining 7.5% of the total variance in the model. A beta value of .274 indicates a moderately weak relationship between NJ ASK 5 LAL and GPA. Much like NJ ASK 5 Math, the higher a student score on NJ ASK 5 Language Arts Literacy, the higher the student's GPA.

Model C – GPA. In Model C GPA multiple regression analysis backward entry method was run to determine the variability of the dependent variable GPA that can be explained by the independent variables gender, free and reduced lunch, attendance, Asian, Hispanic, Other, login square root, NJ ASK 6 Math, and NJ ASK 6 Language Arts Literacy. The descriptive statistics for all variables utilized in the model are contained in Table 26.

Table 26

Descriptive Statistics for Model C- GPA Regression Analysis

	Mean	Std. Deviation	*N*
GPA	3.5057	.52050	179
Gender	.5307	.50045	179
Free Reduced Lunch	.0670	.34507	179
Attendance	5.5894	4.14252	179
Asian	.1508	.35889	179
Hispanic	.1508	.35889	179
Other	.0615	.24083	179
login_sqrt	7.8668	5.02429	179
NJ ASK 6 LAL	220.7989	18.72881	179
NJ ASK 6 Math	235.6927	31.08706	179

The correlation table (Appendix A) was analyzed to determine a relationship between the dependent variable GPA and one or more of the independent variables. There is a positive and statistically significant relationship between GPA, gender, login square root, NJ ASK 6 Math, and NJ ASK 6 LAL. There is a positive relationship between the variable Asian and GPA, but it is not statistically significant. GPA has a negative relationship with free and reduced lunch, attendance, Hispanic, and Other. All of the variables with a negative relationship to GPA were statistically significant.

Table 27

Model C Summary- GPA

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	.770[a]	.592	.571	.34108	.592	27.281	9	169	.000	
2	.769[b]	.591	.572	.34043	-.001	.358	1	169	.551	
3	.768[c]	.589	.573	.34032	-.002	.884	1	170	.349	

4	.766[d]	.587	.572	.34048	-.003	1.159	1	171	.283	2.160

a. Predictors: (Constant), NJ ASK 6 Math, Gender, Other, Free Reduced Lunch, login_sqrt, Asian, Hispanic, Attendance, NJ ASK 6 LAL
b. Predictors: (Constant), NJ ASK 6 Math, Gender, Other, Free Reduced Lunch, login_sqrt, Hispanic, Attendance, NJ ASK 6 LAL
c. Predictors: (Constant), NJ ASK 6 Math, Gender, Other, Free Reduced Lunch, login_sqrt, Attendance, NJ ASK 6 LAL
d. Predictors: (Constant), NJ ASK 6 Math, Gender, Other, login sqrt, Attendance, NJ ASK 6 LAL
e. Dependent Variable: GPA

The R^2 for the fourth model indicates that 58.7% of the variance in student GPA for the sample can be explained by NJ ASK 6 Math, gender, Other, attendance, and NJ ASK 6 Language Arts Literacy. The adjusted R^2 value reveals that 57.2% of the variance in the fourth model can be explained if applied to the entire population. The regression model (Table 28) is statistically significant with $F = 40.66$, $df = 6,172$, $p < .05$ (see Table 27). The Durbin-Watson of 2.160 falls between the acceptable value of 1-4, and therefore there is no autocorrelation between residuals.

Table 28

ANOVA Table for Model C-GPA

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
4	Regression	28.285	6	4.714	40.666	.000[e]
	Residual	19.939	172	.116		
	Total	48.224	178			

a. Dependent Variable: GPA
b. Predictors: (Constant), NJ ASK 6 Math, Gender, Other, login_sqrt, Attendance, NJ ASK 6 LAL

Review of the coefficient table (Table 29) shows that there are six statistically significant predictors: gender, attendance, Other, login square root, NJ ASK 6 LAL, and NJ ASK 6 Math.

See Appendix B for the complete coefficients table iterations created in the backwards design entry method. Multicollinearity was not a problem, as all tolerance values were greater than .413 (<1-R^2); additionally, all reported variance factors (VIFs) were less than 2.

Table 29

Coefficients for Model C-GPA

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
4	(Constant)	.071	.319		.224	.823					
	Gender	.200	.053	.192	3.742	.000	.199	.274	.183	.910	1.099
	Attendance	-.023	.006	-.182	-3.597	.000	-.292	-.264	-.176	.940	1.064
	Other	-.268	.109	-.124	-2.462	.015	-.209	-.185	-.121	.951	1.052
	login_sqrt	.012	.005	.118	2.316	.022	.136	.174	.114	.933	1.072
	NJ ASK 6 LAL	.008	.002	.272	4.131	.000	.624	.300	.203	.554	1.805
	NJ ASK 6 Math	.007	.001	.432	6.635	.000	.656	.451	.325	.566	1.767

a. Dependent Variable: GPA

The predictor gender is both positive and statistically significant (β=.192, t=3.742, ρ < .00), explaining 3.6% of the total variance in the third model. Due to dummy coding with 1=female and 0=male, it can be determined that females are outperforming their male peers. Login square root is also a positive and arguably statistically significant predictor of student performance as defined by GPA (β=.118, t=2.316, p <.05), explaining 1.4% of the total variance in the model. The more times a parent logs in into the Parent Portal, the higher the student's GPA.

Attendance is a negative and statistically significant predictor of GPA. The variable attendance ($\beta = -.182$, $t = -3.597$, $p < .001$) explains 3.3% of the variance in the model. The variable Other is also a negative and statistically significant predictor of GPA. The variable Other ($\beta = -.124$, $t = -2.462$, $p < .05$) explains 1.5% of the total variance in the model. This also means that a student who identifies as Other will have a lower GPA.

NJ ASK 6 Math has a positive and significant influence on GPA ($\beta = .432$, $t = 6.635$, $p < .001$), explaining 18.7% of the total variance in the model. The beta of .432 indicates a moderate relationship between NJ ASK 6 Math and GPA. The higher a student's score on NJ ASK 6 Math, the higher the student's GPA. NJASK 6 Language Arts Literacy is also a positive and significant influence on GPA (ß = .272, t = 4.131, p <.001), explaining 7.4% of the total variance in the model. A beta value of .272 indicates a moderately weak relationship between NJ ASK 6 LAL and GPA. Much like NJ ASK 6 Math, the higher a student's score on NJ ASK 6 Language Arts Literacy, the higher the student's GPA.

Based on the results reported here, Null Hypothesis 1, No statistically significant relationship exists between Parent Portal access and sixth grade student GPA for the school year 2012 when controlling for gender, attendance, free and reduced lunch status, and ethnicity, is rejected.

Research Question 4 – Analysis and Results

What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by NJ ASK 6 Math scores?

Model D – NJ ASK 6 Math. Multiple regression analysis backward entry method was used to determine the variability in the dependent variable NJ ASK 6 Math that can be explained by the independent variables of gender, free and reduced lunch, attendance, Asian, Hispanic,

Other, login square root, and GPA. The descriptive statistics for both the outcome and predictor variables are highlighted in Table 30.

Table 30

Descriptive Statistics for Model D- NJ ASK 6 Math Regression Analysis

	Mean	Std. Deviation	*N*
NJASK 6 Math	236.1938	31.69360	160
Gender	.5563	.49839	160
Free Reduced Lunch	.0438	.28255	160
Attendance	5.6656	4.14278	160
Asian	.1500	.35819	160
Hispanic	.1250	.33176	160
Other	.0500	.21863	160
login_sqrt	7.8624	5.14819	160
GPA	3.5207	.51285	160
NJASK 5 Math	243.4250	30.44751	160

A correlation table (Appendix A) was examined to determine relationships between the dependent variable and one or more independent variables. The Pearson correlation table reveals that there is a positive and statistically significant relationship between NJ ASK 6 Math and Asian, GPA, and NJ ASK 5 Math with all three variables with (p <.005). Gender and login square root were also determined to have a positive relationship to NJ ASK 6 Math, but neither were statistically significant. Attendance and Hispanic had a negative and statistically significant relationship to NJ ASK 6 Math. Free and reduced lunch and other also had negative relationships with NJ ASK 6 Math, but they were not statistically significant.

Table 31

Model D- Summary NJ ASK 6 Math

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	.804[a]	.646	.625	19.41815	.646	30.397	9	150	.000	
2	.804[b]	.646	.627	19.35779	.000	.063	1	150	.803	
3	.803[c]	.646	.629	19.29896	.000	.078	1	151	.781	
4	.803[d]	.645	.631	19.24781	.000	.190	1	152	.663	
5	.802[e]	.643	.631	19.24932	-.002	1.024	1	153	.313	
6	.800[f]	.640	.631	19.25065	-.002	1.021	1	154	.314	
7	.798[g]	.637	.630	19.27542	-.003	1.402	1	155	.238	
8	.796[h]	.634	.629	19.29428	-.003	1.307	1	156	.255	2.006

a. Predictors: (Constant), NJ ASK 5 Math, login_sqrt, Free Reduced Lunch, Other, Asian, Hispanic, Gender, Attendance, GPA

b. Predictors: (Constant), NJ ASK 5 Math, Free Reduced Lunch, Other, Asian, Hispanic, Gender, Attendance, GPA

c. Predictors: (Constant), NJ ASK 5 Math, Free Reduced Lunch, Other, Asian, Hispanic, Attendance, GPA

d. Predictors: (Constant), NJ ASK 5 Math, Free Reduced Lunch, Other, Asian, Attendance, GPA

e. Predictors: (Constant), NJ ASK 5 Math, Free Reduced Lunch, Asian, Attendance, GPA

f. Predictors: (Constant), NJ ASK 5 Math, Asian, Attendance, GPA

g. Predictors: (Constant), NJ ASK 5 Math, Asian, GPA

h. Predictors: (Constant), NJ ASK 5 Math, GPA

i. Dependent Variable: NJ ASK 6 Math

The R^2 for the eighth model indicates that 63.4% of the variance in the NJ ASK 6 Math scores in the sample can be attributed to NJASK 5 Math scores and GPA, while the adjusted R^2 of the eighth model reports 62.9% of the variance in the total population. This regression model is statistically significant, with *(F* =136.013, *df* = 2,157, $p < .05$). The Durbin-Watson of 2.006 falls between the acceptable value of 1-4, and therefore there is no autocorrelation between residuals.

Table 32

ANOVA for Model D- NJ ASK 6 Math

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
8	Regression	101266.714	2	50633.357	136.013	.000[i]
	Residual	58446.280	157	372.269		
	Total	159712.994	159			

a. Dependent Variable: NJ ASK 6 Math
b. Predictors: (Constant), NJ ASK 5 Math, GPA

Examination of the coefficient table (Table 33) reveals that there are two statistically significant predictors of NJ ASK 6 Math, NJ ASK 5 Math, and GPA. See Appendix B for the complete coefficient table iterations created in the backward entry design. Multicollinearity was not an issue, as the tolerance values for both variables were greater than .366 ($<1–R^2$) and both reported VIFs were less than 2.

Table 33

Coefficients for Model D- NJ ASK 6 Math

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
8	(Constant)	25.959	12.838		2.022	.045					
	GPA	18.214	3.849	.295	4.733	.000	.659	.353	.228	.601	1.664
	NJASK 5 Math	.600	.065	.577	9.259	.000	.763	.594	.447	.601	1.664

a. Dependent Variable: NJ ASK 6 Math

The predictor of GPA has a positive and statistically significant influence on performance on the NJ ASK 6 Math ($\beta = .295$, $t = –4.733$, $p < .001$) and explains 8.7% of the total variance in the model. The positive beta indicates the positive relationship and that

essentially the higher a student's GPA, the higher the score on the NJ ASK 6 Math. However, the influence of GPA as a predictor is moderately weak due to the beta value of .295. The closer a beta value is to 1, the stronger the influence of the predictor.

The predictor of NJ ASK 5 Math also has a positive and statistically significant influence on performance on the NJ ASK 5 Math ($\beta = .557$, $t = 9.259$, $p < .001$), explaining 31% of the total variance of the model. The positive beta value of .557 indicates a positive and moderate influence of NJ ASK 5 Math as predictor. The higher a student's score on the NJ ASK 5 Math, the higher the score on the NJ ASK 6 Math. After reviewing Models 5, 6, and 7 for a higher percentage of variance, it was clear that while all the models were significant through the ANOVA table, they accounted for a small amount of the variance, less than 1%, in the model when the beta value was reviewed from the coefficient table.

Null Hypothesis 4, No statistically significant relationship exists between Parent Portal access and sixth grade student performance scores for 2012-2013 on NJ ASK 6 Mathematics when controlling for gender, free and reduced lunch status, and ethnicity, is retained.

Research Question 5 – Analysis and Results

What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by NJ ASK 6 Language Arts scores?

Model E – NJ ASK 6 LAL. Regression analysis with backward entry method was also used to determine the influence of the predictor variables gender, free and reduced lunch status, attendance, Asian, Hispanic, Other, login square root, GPA, and NJ ASK 5 LAL on the outcome variable NJ ASK 6 LAL. The descriptive statistics for the model are reported in Table 34.

Table 34

Descriptive Statistics for Model E- NJ ASK 6 LAL Regression Model

	Mean	Std. Deviation	*N*
NJ ASK 6 LAL	220.8742	18.54066	159
Gender	.5597	.49799	159
Free Reduced Lunch	.0440	.28342	159
Attendance	5.7013	4.13120	159
Asian	.1447	.35286	159
Hispanic	.1258	.33266	159
Other	.0503	.21928	159
login_sqrt	7.8323	5.15030	159
GPA	3.5213	.51441	159
NJ ASK 5 LAL	214.2956	27.89323	159

The correlations table (Appendix A) was examined to determine the relationships between the dependent variable NJ ASK 6 LAL and one or more of the independent variables. The Pearson correlation revealed that free and reduced lunch, attendance, Hispanic, and Other were negatively correlated with NJ ASK 6 LAL while gender, Asian, login square root, and GPA were positively correlated with NJ ASK 6 LAL.

The Pearson correlation table reports that gender, Asian, login square root, GPA, and NJ ASK 5 LAL are all positively related to NJ ASK 6 LAL; however, only GPA and NJ ASK 5 LAL are statistically significant ($p < .05$). Free and reduced lunch, attendance, Hispanic, and Other have a negative relationship to NJ ASK 6 LAL; but only attendance and Other have a statistically significant relationship ($p < .05$).

Table 35

Model E- Summary for NJ ASK 6 LAL

Model	*R*	*R*	Adjusted	Std.	Change Statistics	Durbin

		Square	*R* Square	Error of the Estimate	*R* Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	- Watson
1	.737[a]	.543	.515	12.91229	.543	19.640	9	149	.000	
2	.737[b]	.543	.518	12.86918	.000	.000	1	149	.993	
3	.737[c]	.543	.521	12.82725	.000	.018	1	150	.895	
4	.736[d]	.542	.524	12.79136	.000	.151	1	151	.699	
5	.736[e]	.541	.526	12.76080	-.001	.270	1	152	.604	
6	.735[f]	.540	.528	12.73913	-.001	.477	1	153	.491	
7	.733[g]	.537	.528	12.73596	-.003	.923	1	154	.338	1.976

a. Predictors: (Constant), NJ ASK 5 LAL, login_sqrt, Free Reduced Lunch, Asian, Other, Hispanic, Attendance, Gender, GPA

b. Predictors: (Constant), NJ ASK 5 LAL, login_sqrt, Free Reduced Lunch, Asian, Other, Hispanic, Gender, GPA

c. Predictors: (Constant), NJ ASK 5 LAL, login_sqrt, Free Reduced Lunch, Asian, Other, Gender, GPA

d. Predictors: (Constant), NJ ASK 5 LAL, login_sqrt, Asian, Other, Gender, GPA

e. Predictors: (Constant), NJ ASK 5 LAL, Asian, Other, Gender, GPA

f. Predictors: (Constant), NJ ASK 5 LAL, Other, Gender, GPA

g. Predictors: (Constant), NJ ASK 5 LAL, Other, GPA

h. Dependent Variable: NJ ASK 6 LAL

The R^2 for the NJ ASK 6 LAL Model 7 indicates that 53.7% of the variance in student performance on the NJ ASK 6 LAL for the sample can be explained by NJ ASK 5 LAL, Other, and GPA, while the adjusted R^2 for Model 7 indicates that 52.8% of the variance can be explained for the entire population. The model is statistically significant with F =.59,948, df = 3,155, p <.05. The Durbin-Watson of 1.976 falls between the acceptable value of 1-4, and therefore there is no autocorrelation between residuals.

Table 36

ANOVA for Model E –NJ ASK 6 LAL

Model	Sum of Squares	*df*	Mean Square	*F*	Sig.

	Regression	29171.766	3	9723.922	59.948	.000[h]
7	Residual	25141.719	155	162.205		
	Total	54313.484	158			

a. Dependent Variable: NJ ASK 6 LAL
b. Predictors: (Constant), NJ ASK 5 LAL, Other, GPA

Examination of the standardized coefficient table (Table 37) reveals that three variables, Model 7, Other, GPA, and NJ ASK 5 LAL, were statistically significant predictors of NJ ASK 6 LAL. The entire coefficient table can be found in Appendix B iterations created in the backwards design entry method. Multicollinearity was not an issue, as the tolerance for the variables in the model was greater than .399 with $1–R^2 = .463$; additionally, all three reported VIFs were less than 2.

Table 37

Coefficients for Model E- NJ ASK 6 LAL

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
7	(Constant)	114.355	8.598		13.300	.000					
	Other	-9.787	4.677	-.116	-2.093	.038	-.216	-.166	-.114	.976	1.025
	GPA	16.992	2.360	.471	7.201	.000	.668	.501	.394	.697	1.435
	NJASK 5 LAL	.220	.043	.331	5.103	.000	.595	.379	.279	.709	1.410

a. Dependent Variable: NJ ASK 6 LAL

The predictor of Other has a negative and significant influence on NJ ASK 6 LAL scores (ß = –.166, t = –2.093, p <.05). Due to the dummy coding of Other with Other =1 and Other = 0 combined with the negative beta of –.166 indicates that students coded as Black or multiracial

are outperformed by the reference category, which was White. The predictor of GPA has a statistically significant and positive influence on student performance on the NJ ASK 6 LAL scores (ß = .471, t = 7.201, p <.05), explaining 22% of the total variance in the model. The beta indicates a moderate relationship between GPA and NJ ASK 6 LAL. Essentially, the higher a student's GPA, the higher his or her score on the NJ ASK 6 LAL. NJ ASK 5 LAL was also a positive and significant predictor of performance on the NJ ASK 6 LAL (ß = .331, t = 5.103, p <.05), explaining 10% of the total variance in the model. Much like GPA, the higher a student's score on NJ ASK 5 LAL, the higher his or her score on the NJ ASK 6 LAL. All three variables in the model were statistically significant predictors of performance on the NJ ASK 6 LAL.

After reviewing Models 4, 5, and 6 for a higher percentage of variance, it was clear that while all the models were significant through the ANOVA table, they accounted for a small amount of the variance, less than 1%, in the model when the beta value was reviewed from the coefficient table.

Null Hypothesis 5, No statistically significant relationship exists between Parent Portal access and sixth grade students' performance scores on NJ ASK 6 Language Arts Literacy, is retained.

Research Question 6 – Analysis and Results

What influence, if any, does access to and the use of Parent Portal have on student attendance rates?

Model F – Attendance. In Model F regression analysis, backward entry method was used to determine the amount of variance in the dependent variable attendance that can be explained by gender, free and reduced lunch status, ethnicity classification of Asian, Hispanic,

Other, and parent logins. The descriptive statistics for the outcome variable attendance and the predictor variables listed above re reported in Table 38.

Table 38

Descriptive Statistics for Model F- Attendance Regression Analysis

	Mean	Std. Deviation	N
Attendance	5.5722	4.13735	180
Gender	.5333	.50028	180
Hispanic	.1500	.35807	180
Asian	.1500	.35807	180
Other	.0611	.24020	180
Free Reduced Lunch	.0667	.34414	180
login_sqrt	7.8327	5.03106	180

The correlations table was reviewed for Model F (Appendix A) to determine the relationships between the dependent variable attendance and one or more independent variables. The Pearson correlations revealed that gender, Hispanic, and free and reduced lunch were positively correlated with attendance, while Asian, Other, and login square root were negatively correlated to attendance (see Appendix A).

Table 39

Model F- Attendance Summary

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	.386[a]	.149	.119	3.88271	.149	5.041	6	173	.000	
2	.383[b]	.146	.122	3.87717	-.002	.504	1	173	.479	
3	.376[c]	.141	.122	3.87784	-.005	1.060	1	174	.305	
4	.363[d]	.131	.117	3.88867	-.010	1.984	1	175	.161	1.804

a. Predictors: (Constant), login_sqrt, Free Reduced Lunch, Other, Asian, Hispanic, Gender

b. Predictors: (Constant), login_sqrt, Free Reduced Lunch, Asian, Hispanic, Gender

c. Predictors: (Constant), login_sqrt, Free Reduced Lunch, Asian, Hispanic

d. Predictors: (Constant), Free Reduced Lunch, Asian, Hispanic
e. Dependent Variable: Attendance

The R^2 for Model 4 indicates that 13.1% of the variance of the sample in student attendance can be explained by free and reduced lunch, Asian, and Hispanic, while the adjusted R^2 reports 11.7% of the variance if applied to the entire population from which the sample was drawn. The regression Model 4 is statistically significant ($F = 8.875$, $df = 3.176$, $p < .001$) (see Table 39). The Durbin-Watson of 1.804 falls between the acceptable value of 1-4, and therefore there is no autocorrelation between residuals.

Table 40

ANOVA Table for Model F-Attendance

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
4	Regression	402.638	3	134.213	8.875	.000[e]
	Residual	2661.423	176	15.122		
	Total	3064.061	179			

a. Dependent Variable: Attendance
b. Predictors: (Constant), login_sqrt, Free Reduced Lunch, Other, Asian, Hispanic, Gender
c. Predictors: (Constant), login_sqrt, Free Reduced Lunch, Asian, Hispanic, Gender
d. Predictors: (Constant), login_sqrt, Free Reduced Lunch, Asian, Hispanic
e. Predictors: (Constant), Free Reduced Lunch, Asian, Hispanic

Examination of the coefficient table (Table 41) shows that there are three statistically significant predictors of attendance in Model 4: Hispanic, Asian, and free and reduced lunch. See Appendix B for the complete coefficient table iterations created in the backwards design entry method. With the tolerance values being greater than $1–R^2$ (.883), Multicollinearity was not an issue. Additionally, all reported VIFs were less than 2.

Table 41

Coefficients for Model F- Attendance

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
4	(Constant)	5.536	.350		15.832	.000					
	Hispanic	1.677	.832	.145	2.015	.045	.211	.150	.142	.952	1.051
	Asian	-2.481	.826	-.215	-3.003	.003	-.256	-.221	-.211	.966	1.036
	Free Reduced Lunch	2.349	.855	.195	2.748	.007	.234	.203	.193	.976	1.025

a. Dependent Variable: Attendance

The predictor of Hispanic has a positive and significant influence on attendance (β =.145, t = 2.015, p <.001), explaining 2.1% of the total variance in the model. The beta value of .145 indicates a moderately weak relationship between Hispanic and attendance. The positive influence indicates that when a student identifies as Hispanic, he or she is more likely to have a higher attendance rate or more days absent.

The predictor variable Asian has a negative and significant influence on attendance (β = –.215, t = –3.003, p <.05), explaining 4.6% of the total variance in the model. The beta value indicates a moderately weak relationship between Asian and attendance. The model shows that when a student identifies as Asian, he or she is more likely to have a low attendance rate or fewer absences.

The predictor variable of free and reduced lunch has a positive and statistically significant influence on the outcome variable attendance (β = .195, t = 2.748, p <.05), explaining

3.8% of the total variance in the model. The beta value of .195 indicates a moderately weak relationship between free and reduced lunch and attendance. A student with a free or reduced lunch status is likely to have a higher attendance rate, or more days absent.

Null Hypothesis 6, No statistically significant relationship exists between Parent Portal access and sixth grade student attendance rates, is retained.

Conclusion

Chapter IV contains the results and analyses in answer to Research Questions 1-6. Relationships between student achievement and parent logins were examined through multiple regression analysis backward entry method. The regression analysis results support the notion that parental involvement through Parent Portal logins does influence student achievement although other variables had a stronger influence. The survey data were examined using chi square analysis and descriptive statistics to determine Parent Portal access and its influence on school-to-home communication and parent-to-student communication. The raw percentage data showed that parents feel that access to the portal does improve school to home communication. Further discussion of the results along with implications for policy, practice, and further research takes place in Chapter V.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Introduction

Research has illustrated a link between parental involvement through school-to-home communication and student achievement as well as increased attendance and fewer discipline issues (Sheldon & Epstein, 2004; Spera, 2005). Sheldon and Epstein (2004) found that when initiatives included ten activities that represented the schools' efforts to directly connect with and involve family and community members in ways that support student attendance such as conducting workshops, making home visits, newsletters listing students with excellent attendance, and providing access to children's attendance on the Internet, there was an improvement in student attendance rates. Christopher Spera's (2005) literature review concluded that when parents monitor their children's after-school activities, they facilitate their children's academic achievement and educational attainment.

The purpose of this study was to explore and analyze the nature of the relationship between parent/home-to-school communication through the use of Parent Portal and its possible influence on student achievement as measured by individual academic achievement and attendance. The following research questions were used to guide the research and analysis.

Research Questions

Research Question 1. What evidence, if any, exists that suggests access to and the use of Parent Portal improves parent involvement as defined by the level of home-to-school communication?

Research Question 2. What evidence, if any, exists that suggests access to and the use of Parent Portal improves parent/student communication?

Research Question 3. What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by GPA when controlling for gender, attendance, free and reduced lunch status, and ethnicity?

Research Question 4. What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by NJ ASK 6 Math scores?

Research Question 5. What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by NJ ASK 6 Language Arts scores?

Research Question 6. What influence, if any, does access to and the use of Parent Portal have on student attendance rates?

Null Hypotheses

Null Hypothesis 3. No statistically significant relationship exists between Parent Portal access and sixth grade student GPA when controlling for gender, attendance, free and reduced lunch status, and ethnicity.

Null Hypothesis 4. No statistically significant relationship exists between Parent Portal access and sixth grade student performance scores on NJ ASK 6 Math.

Null Hypothesis 5. No statistically significant relationship exists between Parent Portal access and sixth grade student performance scores on NJ ASK 6 Language Arts Literacy.

Null Hypothesis 6. No statistically significant relationship exists between Parent Portal access and sixth grade student attendance rates.

The sample was drawn from a suburban, northern New Jersey school district housing two middles schools. Sixth graders were utilized throughout the study due to the fact that they did not have access to Parent Portal as fifth graders. Demographic data were collected along with NJ ASK 5 scores, NJ ASK 6 scores, sixth grade GPA, total logins to Parent Portal, and attendance

rates. Survey data were also collected through an online survey administered to the parents of the sample.

The data collected regarding scores, grades, and attendance were analyzed using multiple regression backward entry design to determine a relationship between variables. Survey data were analyzed using chi square analysis to determine frequencies and significance of expected versus observed outcomes.

Conclusions

Research Question 1

What evidence, if any, exists that suggests access to and the use of Parent Portal improves parent involvement as defined by the level of home-to-school communication?

The purpose of this research question was to use survey data to determine if access to Parent Portal improved home-to-school communication. According to data retrieved from the survey (n=49), 100% of the participants agreed or strongly agreed that school-to-home communication was important to their child's success. Seventy-three percent of the respondents agreed or strongly agreed that access to Parent Portal improved their communication with their child's teacher. Sixty-seven percent of respondents agreed or strongly agreed that access to the portal prompted a conversation with their child's teacher. However, while the majority of respondents agreed that access to the Parent Portal increased their communication with the teacher at their child's school, the response that contributed the most to the significance value of the questions was the response *strongly disagree.* However, it must be noted that the *strongly disagree* responses to both questions were chosen by only one person. This contributed to the significance but cannot be attributed to the entire sample, as the majority of respondents agreed or strongly agreed.

Simon (2004) found that the more a school reaches out to the families in the district, the more a parent is actively involved in his or her child's schooling. Hohlfield, Ritzhaupt, and Baron (2010) found that technology increases the modes through which communication with the school takes place. Blau and Hameiri (2012) found that the introduction of an electronic Student Information System to the teachers and families significantly increased communications between teachers and students and teachers and parents. The use of the online system increased parental involvement through communication with the school, specifically the child's teacher. This is supported by the findings of this study where statistically, it was shown that parents do agree that the use of Parent Portal increases communication with the school in the form of the child's teacher.

Parent responses in regard to improved communication with the administration at their child's school varied. Due to the fact that the responses were fairly evenly distributed, I cannot conclusively state that parents agreed that Parent Portal access increased their communication or prompted a conversation with the administration at their child's school.

Research Question 2

What evidence, if any, exists that suggests access to and the use of Parent Portal improves parent/student communication?

The purpose of this research question was to determine if access to the portal improved parent-to-student communication. Parents' involvement in their child's education at home has a positive effect on student achievement (Fan, 2011; Fehrmann, Keith, & Reimers, 1987; Fan & Chen, 2001; Keith & Keith, 1993). Parents reported that overall, Parent Portal access has improved their knowledge of their child's assignments and assessments. A total of 87.7% of parents agreed or strongly agreed that access to the portal has improved their knowledge of

assignments, while a total of 89.2% agreed or strongly agreed that access to the portal improves their knowledge of assessments such as tests and quizzes. Keith and Keith (1993) and Fehrmann, Keith, and Reimers (1987) found that parental involvement had a positive and direct effect on the time students spent doing homework. Keith and Keith (1993) also determined that the amount of time spent on homework has a meaningful effect on student achievement. Chen and Gregory's 2010 study echoed this sentiment by studying parental involvement specifically through homework help at home with ninth graders and found that grade and attainment expectation were the highest predictors of GPA.

The research supports the idea that parental involvement through homework monitoring has a positive effect on student achievement. The results of the survey show that access to the portal increases parents' knowledge of assignments and tests.

A total of 93.8% of parents agreed that access to the portal prompted a conversation with their child. A total of 69.4% parents agreed or strongly agreed that access to the portal prompted a conversation with their child regarding their future plans; however, the response that contributed the most to statistical significance was *strongly disagree*. While *strongly disagree* contributed the most to the significance, it was due to the fact that only one respondent of the 49 chose *strongly disagree*. Ultimately, the responses regarding whether or not the portal prompted a conversation with their child shows that all of the respondents, barring one, agreed or strongly agreed. When asked about a conversation regarding future plans, the responses were evenly distributed between *disagree*, *agree*, and *strongly agree*.

Beth Simon's 2004 study explored the relationship between school outreach and parent conversations with their child regarding future plans. The researcher found that after controlling for prior achievement and adding school outreach to the model, 12% of the variance for parents

talking to teenagers about postsecondary plans is explained by the model. School outreach positively influenced how often parents discussed postsecondary plans with teenagers.

A total of 93.9% of parents agree or strongly agree that access to the portal has prompted a conversation with their child about their assignments, while a total of 85.7% agree or strongly agree that access to the portal has prompted a conversation about their child's assessments such as tests and quizzes. Fan (2011), Fan and Chen (2001), and Keith and Keith (1993) found that parents' educational aspirations for their child have a direct effect on academic growth and student achievement. Conversations with children regarding parents' aspirations for their children are important to a child's academic success. According to the survey outcomes, the use of Parent Portal through the EGB prompts some of these conversations.

A total of 75.5% of parents agree or strongly agree that access to Parent Portal has had an influence on their child's grades After analyzing standardized residuals, it appears that the response that contributed most to the statistical significance of the question was *strongly disagree*. This was because one respondent chose *strongly disagree* for the response. Again, the majority of parents either agreed or strongly agreed that Parent Portal influenced their child's grades. This is supported by the study by Fan and Chen in 2001 that concluded that parent involvement has a direct and meaningful effect on student achievement. Keith and Keith's 1993 study and Fehrmann, Keith, and Reimers' 1987 study support the idea that parental involvement leads to student achievement. For this study, parental involvement was defined by access to the portal.

When asked to respond to questions regarding Parent Portal access and its influence on behaviors at home, a total of 85.3% of parents agreed or strongly agreed that access influenced how they monitor study and homework time. A total of 69.4% of parents agreed or strongly

agreed that access to the portal influenced their use of rewards and discipline at home. Fehrmann, Keith, and Reimers (1997) reported that parental involvement in the form of homework monitoring has a meaningful and direct effect on student achievement. Keith and Keith (1993) found that parental involvement had a strong effect on time spent on homework. They also discovered that time spent on homework had a direct and meaningful effect on student achievement. Parent responses to the survey questions are supported by the research.

Research Question 3

What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by GPA when controlling for gender, attendance, free and reduced lunch status, and ethnicity?

The purpose of this research question was to determine if there was a relationship between EGB access throughout the sixth grade year and the GPA at the end of sixth grade. Model A was run to determine a relationship while controlling for demographic factors such as gender and ethnicity. The total variance explained by the model is 19.9% when applied to the entire population.

While the variable login square root had a positive and statistically significant influence on GPA, it was weak at best, explaining only 1.8% of the variance in the model. The influence was positive, which can be interpreted as the more times a parent logs into Parent Portal, the higher the student GPA will be. The other positive variable that influenced GPA was gender, which explained 5.4% of the variance in the model. This indicates that females are outperforming males in GPA achievement.

Attendance, Hispanic, and Other were all negative and significant influences on GPA and explained more of the variance in the model than logins. Essentially, although logins had a

significant and positive influence on GPA, the stronger influences on GPA were gender, explaining 5.4% of the variance; attendance, which explained 7.7% of the variance; and ethnic classifications of Hispanic and Other, which explained 2.3% and 4.5% of the variance, respectively.

Model B contained the demographic variables entered in Model A with the addition of NJ ASK 5 Math and Language Arts Literacy and explained 56.3% of the variance when applied to the entire population. Similar to Model A, gender and login square root do have an influence on GPA. In Model B the influence of both variables was mild, with gender explaining 3.9% of the variance and login square root explaining 2.1% of the variance. NJ ASK 5 Math and LAL both had a positive influence on GPA, indicating that the higher the student's scores on the NJ ASK 5 Math and LAL, the higher the student's GPA. NJ ASK 5 Math explained 22% of the variance and NJ ASK 5 LAL explained 7.5% of the variance in Model B. This indicates that the variable NJ ASK 5 Math is the strongest predictor of achievement as measured by GPA.

Model C contained the demographic variables entered in both Models A and B with the addition of NJ ASK 6 Math and LAL and explains 57.2% of the variance if applied to the entire population. In Model C, gender and attendance influence student achievement in the form of GPA and also explain 3.6% and 3.3%, respectively, of variance in the model. Parent logins had a positive influence on GPA; however, as with the other models this variable explains a small percentage of the variance, 1.4%. In Model C the variable that explained the most variance was the NJ ASK 6 Math score, which explained 18.7% of the total variance of the model.

Models A, B, and C shared some similarities. Gender consistently had an influence on student achievement. Ma (2008) found that when studying gender differences in achievement throughout the world, the gender gap in the United States favored females in general. Bursol

echoed this sentiment in a 2013 study, which found that females are outperforming their male peers academically.

Attendance had a negative effect on GPA in all three models. Essentially, the more a student is absent from school, the lower his or her GPA. Roby conducted a study in 2003 to determine a link between attendance rates and achievement as measured through the Ohio Proficiency Test and found a moderate to strong relationship between attendance and achievement with the highest being in ninth grade. Sheldon and Epstein (2004) referenced Kamdin (1996) and Myers (2000), who found that students with higher attendance rates (present in school) have higher scores on standardized achievements. Gottfried (2010) found that the relationship between attendance and GPA is positive and significant, which means that students who are more often present is school in the middle school grades have a higher GPA. This model specifically focused on GPA, but its findings mirrored those found in current literature that attendance has an effect on student achievement.

In Model B it was found that prior achievement in the form of NJ ASK 5 Math and LAL had an influence on student achievement as measured by GPA. Current research on the topic of prior achievement and academic performance (Scott et al., 2007; Sparkman et al., 2012; DeBerard et al., 2004) supports the findings that prior achievement has a positive influence on student GPA. Students who perform well at earlier stages in their education will continue that trend.

In all three models, parent logins had a positive influence on student achievement as defined by GPA. While there was some influence, it was moderate at best and explained a very small percentage on the variance in each of the models. The current research supports these findings (Sanders, Epstein, & Connors-Tadros, 1999; Sheldon & Epstein, 2004; Telem & Pinto,

2002). While the research points to parental involvement as a way to increase student achievement, it was found that of all the variables, parent login had the smallest, albeit significant, impact on student achievement.

Based on the results reported here, Null Hypothesis 3, No statistically significant relationship exists between Parent Portal access and sixth grade student GPA when controlling for gender, attendance, free and reduced lunch status, and ethnicity, is rejected. This null hypothesis is rejected on the basis that login square root was found to be a significant and positive contributor to GPA.

Research Question 4

What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by NJ ASK 6 Math scores?

The purpose of this research question was to determine if there is a link between parental involvement and student achievement as defined by NJ ASK 6 Math scores. The two significant variables that influenced achievement as measured by NJ ASK 6 Math scores were GPA and NJ ASK 5 Math scores and explained 62.9% of the variance in Model D. GPA had a weak relationship, explaining 8.7% of the variance in the model, while NJASK 5 Math had a moderate relationship, explaining a higher percentage of the variance (31%) in the model. This again speaks to the idea that the research on prior achievement as an indication of current achievement is supported through this study. Keith and Keith concluded in their 1993 study regarding parental involvement on student achievement that the strongest influence on student achievement was previous achievement. The researchers suggested that this might suggest that parents are more involved when their child performs well in school.

It is also important to note that the two variables discovered to be significant and have the most influence on NJ ASK 6 Math scores accounted for only about 40% of the variance in the entire model through using a backwards entry design. Backwards entry design is utilized to determine the model with the least amount of noise, which can be attributed to the other variables in the model.

Null Hypothesis 4, No statistically significant relationship exists between Parent Portal access and sixth grade student performance scores on NJ ASK 6 Math , is accepted. Login square root did not have a statistically significant influence on student performance as defined by NJ ASK 6 Mathematics scores. For this reason, the null hypothesis is accepted.

Research Question 5

What influence, if any, does access to and the use of Parent Portal have on student achievement as measured by NJ ASK 6 Language Arts scores?

The purpose of this research question was to determine if there was any influence on student achievement as defined by NJ ASK 6 LAL scores by parental involvement. As in the previous model, it was determined that both GPA and NJ ASK 5 LAL performance had a positive influence on NJ ASK 6 LAL performance. GPA explained 22% of the variance, while NJ ASK 5 LAL explained 10% of the variance in the model. The total variance explained by Model E was 52.7%. This supports the idea that prior achievement has an influence on student achievement. Beth Simon (2005) discovered that background and achievement explained 7% of the variance in her model; but when school's outreach to parents was added to the model, 16% of the variance was explained. A student's prior achievement as defined by NJ ASK 5 LAL scores does influence NJ ASK 6 LAL performance as supported by the research.

An additional variable, Other, was added to this model, which explained 1.3% of the variance in the model. Other was the ethnicity code for students who identified as multiracial or Black. This was dummy coded against the reference group, which was White. The variable of Other had a negative influence on NJ ASK 6 LAL scores, which can be interpreted as students who identify as Black or multiracial will be outperformed by their White peers.

Null Hypothesis 5, No statistically significant relationship exists between Parent Portal access and sixth grade student performance scores on NJ ASK 6 Language Arts Literacy, is accepted. As login square root was not a statistically significant influence on NJ ASK 6 LAL scores, the null hypothesis is retained.

Research Question 6

What influence, if any, does access to and the use of Parent Portal have on student attendance rates?

The purpose of this research question was to determine if there was any influence of parental involvement through the use of Parent Portal and student attendance. The variables that were shown to have an influence on student attendance were Asian, Hispanic, and free and reduced lunch status, which explained 11.7% of the variance in Model F. Students who identified as Asian had lower attendance rates, while students who identified as Hispanic or were part of the free and reduced lunch program had higher attendance rates and thus missed more school than students in other groups. The variable Asian explained 4.6% of the total variance in the model, Hispanic explained 2.1% of the total variance, and free and reduced lunch status explained 3.8% of the total variance in Model F.

The research conducted by Sheldon and Epstein (2004) found that when initiatives included ten activities that represented the schools' efforts to directly connect with and involve

family and community members in ways that support student attendance, attendance rates improved. This is in contrast to the current findings, where parental login did not have a significant influence on student attendance. When the students' attendance was made readily accessible to parents through the Parent Portal, there was no significant effect on student attendance rates. This is supported by Beth Simon's 2004 study, which determined that school outreach regarding attendance and behavior were either negatively associated with parental involvement or had no significant association with parental involvement.

Null Hypothesis 6, No statistically significant relationship exists between Parent Portal access and sixth grade student attendance rates, is retained. Login square root did not have any statistically significant influence on attendance as evidenced by the multiple regression results.

The current research has illustrated a link between parental involvement through school-to-home communication and student achievement as well as increased attendance and fewer discipline issues. (Sheldon & Epstein, 2004; Spera, 2005). This study supports that research to some degree. Attendance was not shown to be significantly influenced by logins to the Parent Portal. Student achievement in the form of GPA was influenced by logins to the Parent Portal; but the relationship was weak, showing that compared to other variables such as gender and prior achievement, logins had the smallest influence on achievement. Student achievement as defined by NJ ASK 6 Mathematics and Language Arts Literacy scores were not influenced by Parent Portal logins; therefore, parental involvement did not have an effect on student achievement.

In an effort to increase parental involvement through communication between home and school, Parent Portal was introduced in the sample district. Blau and Hameiri (2012) found in their three-year study that communication between home and school significantly increased with

the introduction of Parent Portal. Their study found that when teachers were highly active in providing information through the portal, students and parents were more likely to log into the portal. The current study found that the majority of the responses to the survey showed that parents agreed or strongly agreed that the portal increased their communication with school, specifically their child's teacher.

Many of the research studies reviewed shared a common idea that the type of parental involvement with the most impact of student achievement is parental expectation of student achievement. Paul G. Fehrmann, Timothy Z. Keith, and Thomas M. Reimers (1987) and Xitao Fan and Michael Chen (2001) discovered that parental aspirations for their children had the greatest influence on achievement. The majority of parents surveyed agreed that access to the portal has prompted a conversation about their child's future plans with their child,

Discussion

The purpose of this study was to examine the nature of the relationship between home-to-school communication through the use of the Parent Portal and its possible effect on student achievement and attendance. Ultimately, access to the Parent Portal had a weak influence on student achievement. While access to the portal had some effect on student achievement as defined by GPA, it was overshadowed by gender and prior achievement. Also, Parent Portal access influenced only one form of academic achievement, GPA, but not achievement defined as NJ ASK 6 Math or LAL scores. Parent Portal access was not found to have any influence on student attendance rates.

This study focused on only one form of parental involvement: communication. Epstein identified six types of involvement, which combine for optimal parental involvement. Parental

involvement was defined through Parent Portal access. These results are limited to a single definition of involvement, which is school-to-home communication.

This study was also limited to one moderately sized district in northern New Jersey with a sample size of 218. The district is located in a suburban neighborhood classified as GH, which is the second highest classification in regard to socioeconomic status. These results are limited to this population and do not allow for inferences to the entire population.

The variable login square root was determined by the number of times a parent logged into the portal. Letters are sent home to parents in the mail containing login information including passwords. The researcher cannot be sure that the parents, and not the students, are logging into the system. This could have an effect on study results regarding logins to the Parent Portal.

Does access to Parent Portal increase parental involvement through school-to-home communication and parent-to-child communication? It would appear that based upon the percentage rates and distribution of answers to the survey questions, parents do feel the portal has affected their conversations with both school and their children; however, the influence of this on student achievement is negligible. It is important to note that these data are gathered from one year, the first year, of Parent Portal access.

It is difficult to make broader statements toward the population due to the limitation of the sample size. Specifically, in regard to the survey, it is difficult to make inferences toward the entire population due to a poor response rate of 24%.

What the researcher ultimately learned is that there is a small influence of parental involvement on student achievement defined as GPA but not NJ ASK 6 scores. Also, although limited to a small response rate, it seems parents believe that access to Parent Portal has

improved their communication with their child's teacher and their access to information regarding tests and assignments. Access to the portal has also influenced their interactions with their child at home regarding grades, assignments, and future plans. While parental involvement, specifically through conversations regarding future plans, has a positive effect on student achievement and parents agree that access to the portal has increased their conversations with their child, logins to the portal had a small influence on achievement defined as GPA.

Recommendations for Policy and Practice

The current policies regarding Parent Portal are limited to regulating how often the portal is updated by teachers and procedures regarding sharing login information with students and families. Currently, letters with instructions regarding how to log in and access the portal are the only information shared with families. Fehrmann, Keith, and Reimers (1987) found that although the effect of parental involvement was small when compared to other student variables, parent involvement could be shaped, unlike ability. This is an important factor to consider when discussing policy and practice implications as a result of this study. It was posited in the research that conversations with children regarding their future plans was influential in regard to student achievement. A practice implication could be to provide more information regarding the portal at back-to-school night, through a mailing or through an evening event. Information regarding proper use, the benefits of accessing the portal, and importance of conversations with their child could be discussed.

Beyond basic instructions regarding how to access the portal, very little information is provided to parents. This study suggests that parents are accessing the portal looking for information regarding grades and assignments and then having conversations with their child regarding that information. Practice implications could extend beyond the frequency of the

updates and include mandates on the quality and depth of the information being provided by the teacher. This study reveals that access to the portal does have a small amount of influence on student achievement and that parents are accessing the portal. Policy could be created to determine the type of information to be shared.

Currently, teachers are mandated to include the name, type, and grade for the assignment being logged; however, the portal has many more capabilities. Teachers can add comments regarding grades given, weighting information, information regarding the assignments and general notes regarding the student. The parent can access all of this information by logging into the system. Perhaps the policy regarding teacher responsibility for updating the portal could include mandates adding comments when students are not performing up to par or an explanation of the assignment or assessment being graded.

General Policy Recommendations

Policies are adopted to address social problems identified as public policy problems. (Fowler, 2004). Education has long been considered a social problem as evidenced by national reform movements. The No Child Left Behind Act of 2001 outlined steps to improve educational outcomes in the United States. One of the areas addressed in the Act was parental involvement and the importance of increasing involvement to increase student achievement. Every school district is different and experiences its own unique issues in regard to parental involvement. NCLB touts the importance of increasing parental involvement but leaves it up to the districts at the state level to make such improvements.

Most policy implementation happens at the district level by school administrators who must be aware of local, state, and federal policy issues. Defining the issue is the first step in policy design. The issue outlined by NCLB is declining student achievement. As a federal Act,

NCLB is a one-size-fits-all response to education reform. At the local level, policy issues differ among districts.

School administrators are challenged to create policies to address the issues outlined in NCLB and also supported by the literature. Parental involvement levels vary from district to district and should be treated as such. It is important to consider the current level of involvement before writing policy to improve upon it. Policy regarding Parent Portal as a means for parental involvement must be considered within the context of the district.

Recommendations for Future Research

This study added to the minimal empirical studies on parental involvement and its effect on student achievement. As this study was limited to a small sample size in a specific area of the country, further research is recommended to fully answer the research questions posed in this paper.

1. A study at the high school level is recommended to increase the population for which implications based upon results can be addressed at a different level of education. Also, the influence of Parent Portal access on graduation rates can be added to the study.

2. This study could be replicated with a larger population in different district settings such as rural, urban, and other suburban settings to test for study validity in other populations.

3. A longitudinal study could be designed using the same sample to determine if more experience with the portal over a longer period of time has any effect on the outcomes.

It is important to note that further research is warranted due to the fact that the state assessment is transitioning to PARCC, which takes place in Grades 3-11. In the current sample, Parent Portal was only available to the participants for one year at the time of the study. Further

review on this topic is warranted to determine long term effects of access to the portal on student achievement, school-to-home communication and parent-to-student communication.

In summary, parents felt that access to Parent Portal increased their communication with the teacher at their child's school but not with the administration. Parents also felt that access to the portal provided them with information regarding assignments and assessments and prompted conversations with their children. Access to Parent Portal had a small influence on achievement as defined by GPA but not NJ ASK 6 Math, Math LAL, or attendance rates. These findings should be considered in relation to practice, specifically how teachers and parents are trained to report and access information.

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Appendix A

Correlation Tables for Regression Analysis

Correlation Table Model A-GPA

Correlations

		GPA	Gender	Free Reduced Lunch	Attendance	Asian	Hispanic	Other	login_sqrt
Pearson Correlation	GPA	1.000	.200	-.162	-.293	.102	-.202	-.209	.134
	Gender	.200	1.000	-.143	.078	-.075	-.012	-.087	-.225
	Free Reduced Lunch	-.162	-.143	1.000	.234	-.082	.145	-.050	.005
	Attendance	-.293	.078	.234	1.000	-.256	.211	-.052	-.092
	Asian	.102	-.075	-.082	-.256	1.000	-.176	-.107	-.075
	Hispanic	-.202	-.012	.145	.211	-.176	1.000	-.107	-.078
	Other	-.209	-.087	-.050	-.052	-.107	-.107	1.000	-.058
	login_sqrt	.134	-.225	.005	-.092	-.075	-.078	-.058	1.000
Sig. (1-tailed)	GPA	.	.004	.015	.000	.087	.003	.002	.037
	Gender	.004	.	.028	.148	.159	.434	.123	.001
	Free Reduced Lunch	.015	.028	.	.001	.138	.026	.254	.475
	Attendance	.000	.148	.001	.	.000	.002	.243	.109
	Asian	.087	.159	.138	.000	.	.009	.076	.159
	Hispanic	.003	.434	.026	.002	.009	.	.076	.150
	Other	.002	.123	.254	.243	.076	.076	.	.220
	login_sqrt	.037	.001	.475	.109	.159	.150	.220	.
N	GPA	180	180	180	180	180	180	180	180
	Gender	180	180	180	180	180	180	180	180
	Free Reduced Lunch	180	180	180	180	180	180	180	180
	Attendance	180	180	180	180	180	180	180	180
	Asian	180	180	180	180	180	180	180	180
	Hispanic	180	180	180	180	180	180	180	180
	Other	180	180	180	180	180	180	180	180
	login_sqrt	180	180	180	180	180	180	180	180

Correlation Table Model B-GPA

Correlations

		GPA	Gender	Free Reduced Lunch	Attendance	Asian	Hispanic	Other	login_sqrt	NJASK 5 Math	NJASK 5 LAL
Pearson Correlation	GPA	1.000	.181	-.142	-.305	.113	-.192	-.155	.129	.632	.539
	Gender	.181	1.000	-.086	.076	-.031	.031	-.028	-.242	-.072	.223
	Free Reduced Lunch	-.142	-.086	1.000	.122	-.064	-.059	-.036	-.010	-.028	-.067
	Attendance	-.305	.076	.122	1.000	-.220	.184	-.029	-.121	-.276	-.053
	Asian	.113	-.031	-.064	-.220	1.000	-.156	-.095	-.085	.173	.059
	Hispanic	-.192	.031	-.059	.184	-.156	1.000	-.087	-.038	-.191	-.117
	Other	-.155	-.028	-.036	-.029	-.095	-.087	1.000	-.098	-.055	-.083
	login_sqrt	.129	-.242	-.010	-.121	-.085	-.038	-.098	1.000	.029	-.034
	NJASK 5 Math	.632	-.072	-.028	-.276	.173	-.191	-.055	.029	1.000	.446
	NJASK 5 LAL	.539	.223	-.067	-.053	.059	-.117	-.083	-.034	.446	1.000
Sig. (1-tailed)	GPA	.	.011	.037	.000	.078	.008	.026	.052	.000	.000
	Gender	.011	.	.140	.172	.347	.350	.364	.001	.182	.002
	Free Reduced Lunch	.037	.140	.	.063	.211	.230	.327	.449	.361	.200
	Attendance	.000	.172	.063	.	.003	.010	.360	.065	.000	.254
	Asian	.078	.347	.211	.003	.	.025	.118	.143	.015	.229
	Hispanic	.008	.350	.230	.010	.025	.	.137	.319	.008	.071
	Other	.026	.364	.327	.360	.118	.137	.	.110	.244	.149
	login_sqrt	.052	.001	.449	.065	.143	.319	.110	.	.359	.334
	NJASK 5 Math	.000	.182	.361	.000	.015	.008	.244	.359	.	.000
	NJASK 5 LAL	.000	.002	.200	.254	.229	.071	.149	.334	.000	.
N	GPA	159	159	159	159	159	159	159	159	159	159
	Gender	159	159	159	159	159	159	159	159	159	159
	Free Reduced Lunch	159	159	159	159	159	159	159	159	159	159
	Attendance	159	159	159	159	159	159	159	159	159	159

	Asian	159	159	159	159	159	159	159	159	159	159
	Hispanic	159	159	159	159	159	159	159	159	159	159
	Other	159	159	159	159	159	159	159	159	159	159
	login_sqrt	159	159	159	159	159	159	159	159	159	159
	NJASK 5 Math	159	159	159	159	159	159	159	159	159	159
	NJASK 5 LAL	159	159	159	159	159	159	159	159	159	159

Correlation Table Model C-GPA

Correlations

		GPA	Gender	Free Reduced Lunch	Attendance	Asian	Hispanic	Other	login_sqrt	NJASK 6 LAL	NJASK 6 Math
Pearson Correlation	GPA	1.000	.199	-.162	-.292	.103	-.202	-.209	.136	.624	.656
	Gender	.199	1.000	-.142	.083	-.073	-.010	-.086	-.220	.136	.000
	Free Reduced Lunch	-.162	-.142	1.000	.234	-.082	.145	-.050	.003	-.071	-.067
	Attendance	-.292	.083	.234	1.000	-.259	.210	-.053	-.098	-.112	-.209
	Asian	.103	-.073	-.082	-.259	1.000	-.178	-.108	-.078	.007	.191
	Hispanic	-.202	-.010	.145	.210	-.178	1.000	-.108	-.081	-.112	-.201
	Other	-.209	-.086	-.050	-.053	-.108	-.108	1.000	-.060	-.179	-.051
	login_sqrt	.136	-.220	.003	-.098	-.078	-.081	-.060	1.000	.059	.046
	NJASK 6 LAL	.624	.136	-.071	-.112	.007	-.112	-.179	.059	1.000	.638
	NJASK 6 Math	.656	.000	-.067	-.209	.191	-.201	-.051	.046	.638	1.000
Sig. (1-tailed)	GPA	.	.004	.015	.000	.086	.003	.003	.034	.000	.000
	Gender	.004	.	.029	.136	.166	.446	.127	.002	.035	.500
	Free Reduced Lunch	.015	.029	.	.001	.137	.027	.254	.482	.173	.188
	Attendance	.000	.136	.001	.	.000	.002	.239	.096	.067	.002
	Asian	.086	.166	.137	.000	.	.009	.075	.149	.463	.005
	Hispanic	.003	.446	.027	.002	.009	.	.075	.141	.068	.004
	Other	.003	.127	.254	.239	.075	.075	.	.213	.008	.247
	login_sqrt	.034	.002	.482	.096	.149	.141	.213	.	.215	.272

	NJASK 6 LAL	.000	.035	.173	.067	.463	.068	.008	.215	.	.000
	NJASK 6 Math	.000	.500	.188	.002	.005	.004	.247	.272	.000	.
	GPA	179	179	179	179	179	179	179	179	179	179
	Gender	179	179	179	179	179	179	179	179	179	179
	Free Reduced Lunch	179	179	179	179	179	179	179	179	179	179
	Attendance	179	179	179	179	179	179	179	179	179	179
	Asian	179	179	179	179	179	179	179	179	179	179
N	Hispanic	179	179	179	179	179	179	179	179	179	179
	Other	179	179	179	179	179	179	179	179	179	179
	login_sqrt	179	179	179	179	179	179	179	179	179	179
	NJASK 6 LAL	179	179	179	179	179	179	179	179	179	179
	NJASK 6 Math	179	179	179	179	179	179	179	179	179	179

Correlation Table Model D-NJASK 6 Math

Correlations

		NJASK 6 Math	Gender	Free Reduced Lunch	Attendance	Asian	Hispanic	Other	login_sqrt	GPA	NJASK 5 Math
	NJASK 6 Math	1.000	.005	-.009	-.201	.178	-.157	-.042	.029	.659	.763
	Gender	.005	1.000	-.085	.085	-.048	.033	-.026	-.247	.181	-.067
	Free Reduced Lunch	-.009	-.085	1.000	.123	-.065	-.059	-.036	-.011	-.142	-.028
	Attendance	-.201	.085	.123	1.000	-.235	.186	-.027	-.128	-.302	-.267
Pearson Correlation	Asian	.178	-.048	-.065	-.235	1.000	-.159	-.096	-.070	.108	.159
	Hispanic	-.157	.033	-.059	.186	-.159	1.000	-.087	-.040	-.191	-.189
	Other	-.042	-.026	-.036	-.027	-.096	-.087	1.000	-.099	-.155	-.054
	login_sqrt	.029	-.247	-.011	-.128	-.070	-.040	-.099	1.000	.128	.025
	GPA	.659	.181	-.142	-.302	.108	-.191	-.155	.128	1.000	.632
	NJASK 5 Math	.763	-.067	-.028	-.267	.159	-.189	-.054	.025	.632	1.000

	NJASK 6 Math	.	.473	.457	.005	.012	.024	.298	.357	.000	.000
	Gender	.473	.	.144	.144	.275	.338	.372	.001	.011	.200
	Free Reduced Lunch	.457	.144	.	.061	.206	.230	.327	.445	.037	.364
	Attendance	.005	.144	.061	.	.001	.009	.369	.054	.000	.000
Sig. (1-tailed)	Asian	.012	.275	.206	.001	.	.022	.113	.191	.087	.022
	Hispanic	.024	.338	.230	.009	.022	.	.138	.309	.008	.008
	Other	.298	.372	.327	.369	.113	.138	.	.107	.025	.248
	login_sqrt	.357	.001	.445	.054	.191	.309	.107	.	.053	.379
	GPA	.000	.011	.037	.000	.087	.008	.025	.053	.	.000
	NJASK 5 Math	.000	.200	.364	.000	.022	.008	.248	.379	.000	.
	NJASK 6 Math	160	160	160	160	160	160	160	160	160	160
	Gender	160	160	160	160	160	160	160	160	160	160
	Free Reduced Lunch	160	160	160	160	160	160	160	160	160	160
	Attendance	160	160	160	160	160	160	160	160	160	160
N	Asian	160	160	160	160	160	160	160	160	160	160
	Hispanic	160	160	160	160	160	160	160	160	160	160
	Other	160	160	160	160	160	160	160	160	160	160
	login_sqrt	160	160	160	160	160	160	160	160	160	160
	GPA	160	160	160	160	160	160	160	160	160	160
	NJASK 5 Math	160	160	160	160	160	160	160	160	160	160

Correlation Table Model E - NJASK 6 LAL

Correlations

		NJASK 6 LAL	Gender	Free Reduced Lunch	Attendance	Asian	Hispanic	Other	login_sqrt	GPA	NJASK 5 LAL
Pearson Correlation	NJASK 6 LAL	1.000	.111	-.100	-.157	.049	-.122	-.216	.052	.668	.595
	Gender	.111	1.000	-.086	.076	-.031	.031	-.028	-.242	.181	.223

	Free Reduced Lunch	-.100	-.086	1.000	.122	-.064	-.059	-.036	-.010	-.142	-.067
	Attendance	-.157	.076	.122	1.000	-.220	.184	-.029	-.121	-.305	-.053
	Asian	.049	-.031	-.064	-.220	1.000	-.156	-.095	-.085	.113	.059
	Hispanic	-.122	.031	-.059	.184	-.156	1.000	-.087	-.038	-.192	-.117
	Other	-.216	-.028	-.036	-.029	-.095	-.087	1.000	-.098	-.155	-.083
	login_sqrt	.052	-.242	-.010	-.121	-.085	-.038	-.098	1.000	.129	-.034
	GPA	.668	.181	-.142	-.305	.113	-.192	-.155	.129	1.000	.539
	NJASK 5 LAL	.595	.223	-.067	-.053	.059	-.117	-.083	-.034	.539	1.000
	NJASK 6 LAL	.	.081	.105	.024	.269	.063	.003	.257	.000	.000
	Gender	.081	.	.140	.172	.347	.350	.364	.001	.011	.002
	Free Reduced Lunch	.105	.140	.	.063	.211	.230	.327	.449	.037	.200
	Attendance	.024	.172	.063	.	.003	.010	.360	.065	.000	.254
Sig. (1-tailed)	Asian	.269	.347	.211	.003	.	.025	.118	.143	.078	.229
	Hispanic	.063	.350	.230	.010	.025	.	.137	.319	.008	.071
	Other	.003	.364	.327	.360	.118	.137	.	.110	.026	.149
	login_sqrt	.257	.001	.449	.065	.143	.319	.110	.	.052	.334
	GPA	.000	.011	.037	.000	.078	.008	.026	.052	.	.000
	NJASK 5 LAL	.000	.002	.200	.254	.229	.071	.149	.334	.000	.
	NJASK 6 LAL	159	159	159	159	159	159	159	159	159	159
	Gender	159	159	159	159	159	159	159	159	159	159
	Free Reduced Lunch	159	159	159	159	159	159	159	159	159	159
	Attendance	159	159	159	159	159	159	159	159	159	159
N	Asian	159	159	159	159	159	159	159	159	159	159
	Hispanic	159	159	159	159	159	159	159	159	159	159
	Other	159	159	159	159	159	159	159	159	159	159
	login_sqrt	159	159	159	159	159	159	159	159	159	159
	GPA	159	159	159	159	159	159	159	159	159	159
	NJASK 5 LAL	159	159	159	159	159	159	159	159	159	159

Correlation Table Model F-Attendance

Correlations

		Attendance	Gender	Hispanic	Asian	Other	Free Reduced Lunch	login_sqrt
Pearson Correlation	Attendance	1.000	.078	.211	-.256	-.052	.234	-.092
	Gender	.078	1.000	-.012	-.075	-.087	-.143	-.225
	Hispanic	.211	-.012	1.000	-.176	-.107	.145	-.078
	Asian	-.256	-.075	-.176	1.000	-.107	-.082	-.075
	Other	-.052	-.087	-.107	-.107	1.000	-.050	-.058
	Free Reduced Lunch	.234	-.143	.145	-.082	-.050	1.000	.005
	login_sqrt	-.092	-.225	-.078	-.075	-.058	.005	1.000
Sig. (1-tailed)	Attendance	.	.148	.002	.000	.243	.001	.109
	Gender	.148	.	.434	.159	.123	.028	.001
	Hispanic	.002	.434	.	.009	.076	.026	.150
	Asian	.000	.159	.009	.	.076	.138	.159
	Other	.243	.123	.076	.076	.	.254	.220
	Free Reduced Lunch	.001	.028	.026	.138	.254	.	.475
	login_sqrt	.109	.001	.150	.159	.220	.475	.
N	Attendance	180	180	180	180	180	180	180
	Gender	180	180	180	180	180	180	180
	Hispanic	180	180	180	180	180	180	180
	Asian	180	180	180	180	180	180	180
	Other	180	180	180	180	180	180	180
	Free Reduced Lunch	180	180	180	180	180	180	180
	login_sqrt	180	180	180	180	180	180	180

Appendix B

Complete Coefficient Tables for Regression Analyses

Coefficients Table Model A-GPA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3.520	.108		32.651	.000					
	Gender	.232	.074	.223	3.150	.002	.200	.234	.212	.898	1.114
	Free Reduced Lunch	-.088	.106	-.058	-.826	.410	-.162	-.063	-.055	.908	1.101
	Attendance	-.033	.009	-.262	-3.598	.000	-.293	-.265	-.242	.851	1.175
	Asian	.012	.104	.008	.117	.907	.102	.009	.008	.877	1.141
	Hispanic	-.213	.102	-.147	-2.080	.039	-.202	-.157	-.140	.909	1.100
	Other	-.460	.149	-.213	-3.084	.002	-.209	-.229	-.207	.945	1.058
	login_sqrt	.014	.007	.137	1.948	.053	.134	.147	.131	.912	1.096
2	(Constant)	3.525	.098		35.865	.000					
	Gender	.231	.073	.222	3.165	.002	.200	.234	.212	.909	1.101
	Free Reduced Lunch	-.088	.106	-.058	-.832	.407	-.162	-.063	-.056	.909	1.100
	Attendance	-.033	.009	-.264	-3.733	.000	-.293	-.273	-.250	.897	1.114
	Hispanic	-.214	.101	-.148	-2.130	.035	-.202	-.160	-.143	.931	1.074
	Other	-.463	.147	-.214	-3.152	.002	-.209	-.233	-.211	.970	1.031
	login_sqrt	.014	.007	.136	1.957	.052	.134	.147	.131	.932	1.073
3	(Constant)	3.523	.098		35.888	.000					
	Gender	.241	.072	.232	3.351	.001	.200	.246	.224	.934	1.071
	Attendance	-.035	.009	-.277	-4.024	.000	-.293	-.292	-.269	.944	1.059
	Hispanic	-.222	.100	-.153	-2.218	.028	-.202	-.166	-.148	.939	1.065
	Other	-.458	.147	-.212	-3.121	.002	-.209	-.230	-.209	.972	1.029
	login_sqrt	.014	.007	.136	1.964	.051	.134	.147	.131	.932	1.073

a. Dependent Variable: GPA

Coefficients Table Model B-GPA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.476	.285		1.670	.097					
	Gender	.198	.060	.191	3.303	.001	.181	.261	.177	.854	1.171
	Free Reduced Lunch	-.153	.099	-.084	-1.538	.126	-.142	-.125	-.082	.961	1.041
	Attendance	-.018	.007	-.146	-2.513	.013	-.305	-.202	-.135	.844	1.184
	Asian	-.033	.082	-.023	-.403	.688	.113	-.033	-.022	.896	1.116
	Hispanic	-.097	.087	-.063	-1.115	.266	-.192	-.091	-.060	.910	1.098
	Other	-.242	.129	-.103	-1.878	.062	-.155	-.152	-.101	.951	1.052
	login_sqrt	.014	.006	.138	2.451	.015	.129	.197	.131	.899	1.112
	NJASK 5 Math	.008	.001	.467	7.282	.000	.632	.512	.390	.698	1.433
	NJASK 5 LAL	.005	.001	.265	4.214	.000	.539	.326	.226	.725	1.380
2	(Constant)	.472	.284		1.662	.099					
	Gender	.199	.060	.192	3.333	.001	.181	.263	.178	.855	1.169
	Free Reduced Lunch	-.150	.099	-.083	-1.521	.130	-.142	-.123	-.081	.964	1.037
	Attendance	-.018	.007	-.142	-2.488	.014	-.305	-.199	-.133	.871	1.148
	Hispanic	-.092	.086	-.060	-1.077	.283	-.192	-.088	-.057	.925	1.081
	Other	-.235	.127	-.100	-1.846	.067	-.155	-.149	-.099	.966	1.035
	login_sqrt	.014	.006	.142	2.538	.012	.129	.203	.136	.917	1.090
	NJASK 5 Math	.008	.001	.465	7.295	.000	.632	.512	.390	.703	1.422
	NJASK 5 LAL	.005	.001	.266	4.233	.000	.539	.327	.226	.725	1.380
3	(Constant)	.417	.280		1.492	.138					
	Gender	.198	.060	.192	3.321	.001	.181	.261	.177	.855	1.169
	Free Reduced Lunch	-.141	.098	-.077	-1.428	.155	-.142	-.115	-.076	.972	1.029
	Attendance	-.019	.007	-.151	-2.671	.008	-.305	-.212	-.143	.890	1.124
	Other	-.221	.127	-.094	-1.743	.083	-.155	-.140	-.093	.977	1.024
	login_sqrt	.014	.006	.143	2.567	.011	.129	.204	.137	.918	1.090
	NJASK 5 Math	.008	.001	.472	7.453	.000	.632	.519	.398	.712	1.405

	NJASK 5 LAL	.005	.001	.270	4.307	.000	.539	.331	.230	.728	1.374
	(Constant)	.403	.280		1.437	.153					
	Gender	.205	.060	.199	3.440	.001	.181	.269	.184	.861	1.161
	Attendance	-.020	.007	-.161	-2.859	.005	-.305	-.226	-.153	.903	1.107
4	Other	-.214	.127	-.091	-1.681	.095	-.155	-.135	-.090	.979	1.022
	login_sqrt	.014	.006	.145	2.590	.011	.129	.206	.139	.918	1.089
	NJASK 5 Math	.008	.001	.470	7.400	.000	.632	.515	.397	.712	1.405
	NJASK 5 LAL	.005	.001	.274	4.365	.000	.539	.334	.234	.729	1.371

a. Dependent Variable: GPA

Coefficients Table Model C-GPA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
	(Constant)	.151	.325		.465	.643					
	Gender	.186	.054	.179	3.415	.001	.199	.254	.168	.879	1.137
	Free Reduced Lunch	-.078	.078	-.052	-1.004	.317	-.162	-.077	-.049	.907	1.102
	Attendance	-.021	.007	-.168	-3.128	.002	-.292	-.234	-.154	.832	1.202
1	Asian	-.047	.078	-.032	-.598	.551	.103	-.046	-.029	.839	1.192
	Hispanic	-.076	.076	-.053	-1.011	.313	-.202	-.078	-.050	.888	1.126
	Other	-.298	.112	-.138	-2.671	.008	-.209	-.201	-.131	.905	1.105
	login_sqrt	.011	.005	.109	2.115	.036	.136	.161	.104	.909	1.100
	NJASK 6 LAL	.007	.002	.264	3.953	.000	.624	.291	.194	.539	1.855
	NJASK 6 Math	.007	.001	.432	6.428	.000	.656	.443	.316	.534	1.872
	(Constant)	.124	.322		.386	.700					
	Gender	.189	.054	.181	3.481	.001	.199	.258	.171	.885	1.130
	Free Reduced Lunch	-.077	.078	-.051	-.987	.325	-.162	-.076	-.048	.908	1.101
2	Attendance	-.020	.007	-.162	-3.076	.002	-.292	-.230	-.151	.870	1.149
	Hispanic	-.070	.075	-.048	-.940	.349	-.202	-.072	-.046	.905	1.105
	Other	-.286	.110	-.132	-2.611	.010	-.209	-.196	-.128	.935	1.069

	login_sqrt	.012	.005	.113	2.226	.027	.136	.168	.109	.928	1.078
	NJASK 6 LAL	.008	.002	.271	4.111	.000	.624	.301	.202	.554	1.807
	NJASK 6 Math	.007	.001	.424	6.446	.000	.656	.443	.316	.555	1.801
	(Constant)	.084	.319		.264	.792					
	Gender	.191	.054	.183	3.519	.001	.199	.260	.172	.886	1.129
	Free Reduced Lunch	-.083	.077	-.055	-1.077	.283	-.162	-.082	-.053	.916	1.092
3	Attendance	-.021	.007	-.169	-3.242	.001	-.292	-.241	-.159	.888	1.127
	Other	-.274	.109	-.127	-2.522	.013	-.209	-.189	-.124	.947	1.056
	login_sqrt	.012	.005	.117	2.305	.022	.136	.174	.113	.933	1.072
	NJASK 6 LAL	.008	.002	.270	4.104	.000	.624	.299	.201	.554	1.806
	NJASK 6 Math	.007	.001	.433	6.639	.000	.656	.453	.325	.566	1.767
	(Constant)	.071	.319		.224	.823					
	Gender	.200	.053	.192	3.742	.000	.199	.274	.183	.910	1.099
	Attendance	-.023	.006	-.182	-3.597	.000	-.292	-.264	-.176	.940	1.064
4	Other	-.268	.109	-.124	-2.462	.015	-.209	-.185	-.121	.951	1.052
	login_sqrt	.012	.005	.118	2.316	.022	.136	.174	.114	.933	1.072
	NJASK 6 LAL	.008	.002	.272	4.131	.000	.624	.300	.203	.554	1.805
	NJASK 6 Math	.007	.001	.432	6.635	.000	.656	.451	.325	.566	1.767

a. Dependent Variable: GPA

Coefficients Table Model D-NJASK 6 Math

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
	(Constant)	17.184	15.125		1.136	.258					
	Gender	-1.162	3.424	-.018	-.339	.735	.005	-.028	-.016	.814	1.228
	Free Reduced Lunch	6.088	5.605	.054	1.086	.279	-.009	.088	.053	.946	1.058
1	Attendance	.458	.411	.060	1.116	.266	-.201	.091	.054	.820	1.220
	Asian	6.782	4.550	.077	1.490	.138	.178	.121	.072	.893	1.120
	Hispanic	2.128	4.885	.022	.436	.664	-.157	.036	.021	.903	1.107
	Other	7.512	7.309	.052	1.028	.306	-.042	.084	.050	.929	1.077

	login_sqrt	-.081	.322	-.013	-.250	.803	.029	-.020	-.012	.865	1.156
	GPA	21.043	4.341	.341	4.847	.000	.659	.368	.236	.478	2.090
	NJASK 5 Math	.582	.069	.559	8.469	.000	.763	.569	.411	.542	1.847
	(Constant)	16.476	14.812		1.112	.268					
	Gender	-.908	3.260	-.014	-.278	.781	.005	-.023	-.013	.893	1.120
	Free Reduced Lunch	6.096	5.587	.054	1.091	.277	-.009	.088	.053	.946	1.058
	Attendance	.468	.407	.061	1.148	.253	-.201	.093	.056	.827	1.209
2	Asian	6.920	4.502	.078	1.537	.126	.178	.124	.074	.906	1.104
	Hispanic	2.157	4.868	.023	.443	.658	-.157	.036	.021	.903	1.107
	Other	7.688	7.253	.053	1.060	.291	-.042	.086	.051	.937	1.067
	GPA	20.834	4.247	.337	4.906	.000	.659	.371	.238	.497	2.013
	NJASK 5 Math	.584	.068	.561	8.613	.000	.763	.574	.417	.552	1.811
	(Constant)	16.290	14.752		1.104	.271					
	Free Reduced Lunch	6.176	5.563	.055	1.110	.269	-.009	.090	.054	.948	1.055
	Attendance	.454	.403	.059	1.126	.262	-.201	.091	.054	.840	1.190
3	Asian	6.936	4.488	.078	1.545	.124	.178	.124	.075	.906	1.103
	Hispanic	2.115	4.851	.022	.436	.663	-.157	.035	.021	.904	1.106
	Other	7.638	7.229	.053	1.057	.292	-.042	.085	.051	.938	1.066
	GPA	20.482	4.042	.331	5.067	.000	.659	.380	.245	.545	1.834
	NJASK 5 Math	.589	.066	.565	8.915	.000	.763	.586	.430	.580	1.725
	(Constant)	17.541	14.432		1.215	.226					
	Free Reduced Lunch	5.912	5.515	.053	1.072	.285	-.009	.086	.052	.959	1.042
	Attendance	.472	.400	.062	1.180	.240	-.201	.095	.057	.849	1.178
4	Asian	6.686	4.440	.076	1.506	.134	.178	.121	.073	.921	1.085
	Other	7.237	7.151	.050	1.012	.313	-.042	.082	.049	.953	1.049
	GPA	20.289	4.007	.328	5.063	.000	.659	.379	.244	.552	1.812
	NJASK 5 Math	.587	.066	.564	8.928	.000	.763	.585	.430	.581	1.721
	(Constant)	19.658	14.280		1.377	.171					
	Free Reduced Lunch	5.564	5.505	.050	1.011	.314	-.009	.081	.049	.963	1.038
5	Attendance	.436	.398	.057	1.096	.275	-.201	.088	.053	.856	1.169
	Asian	6.198	4.414	.070	1.404	.162	.178	.112	.068	.932	1.073
	GPA	19.572	3.944	.317	4.962	.000	.659	.371	.239	.570	1.756
	NJASK 5 Math	.591	.066	.568	9.012	.000	.763	.588	.434	.584	1.714
	(Constant)	20.238	14.270		1.418	.158					
6	Attendance	.470	.397	.061	1.184	.238	-.201	.095	.057	.862	1.160
	Asian	6.008	4.410	.068	1.362	.175	.178	.109	.066	.934	1.071

	GPA	18.999	3.904	.307	4.867	.000	.659	.364	.234	.582	1.719
	NJASK 5 Math	.598	.065	.574	9.147	.000	.763	.592	.441	.589	1.698
	(Constant)	27.510	12.897		2.133	.034					
7	Asian	4.943	4.323	.056	1.143	.255	.178	.091	.055	.975	1.026
	GPA	18.169	3.845	.294	4.725	.000	.659	.354	.228	.601	1.664
	NJASK 5 Math	.591	.065	.568	9.069	.000	.763	.588	.437	.593	1.687
	(Constant)	25.959	12.838		2.022	.045					
8	GPA	18.214	3.849	.295	4.733	.000	.659	.353	.228	.601	1.664
	NJASK 5 Math	.600	.065	.577	9.259	.000	.763	.594	.447	.601	1.664

a. Dependent Variable: NJASK 6 Math

Coefficients Table Model E-NJASK 6 LAL

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
	(Constant)	114.640	9.721		11.793	.000					
	Gender	-2.440	2.222	-.066	-1.098	.274	.111	-.090	-.061	.862	1.161
	Free Reduced Lunch	-1.473	3.716	-.023	-.396	.692	-.100	-.032	-.022	.951	1.051
	Attendance	.002	.275	.001	.009	.993	-.157	.001	.000	.817	1.224
1	Asian	-2.329	3.064	-.044	-.760	.448	.049	-.062	-.042	.903	1.107
	Hispanic	-.431	3.248	-.008	-.133	.895	-.122	-.011	-.007	.904	1.106
	Other	-10.478	4.855	-.124	-2.158	.033	-.216	-.174	-.120	.931	1.074
	login_sqrt	-.112	.213	-.031	-.524	.601	.052	-.043	-.029	.877	1.140
	GPA	17.400	2.623	.483	6.633	.000	.668	.477	.367	.579	1.726
	NJASK 5 LAL	.225	.045	.338	5.021	.000	.595	.380	.278	.677	1.478
	(Constant)	114.667	9.163		12.515	.000					
	Gender	-2.438	2.206	-.065	-1.105	.271	.111	-.090	-.061	.869	1.151
2	Free Reduced Lunch	-1.470	3.690	-.022	-.398	.691	-.100	-.033	-.022	.958	1.043
	Asian	-2.334	2.999	-.044	-.778	.438	.049	-.063	-.043	.936	1.068

	Hispanic	-.428	3.220	-.008	-.133	.895	-.122	-.011	-.007	.914	1.094
	Other	-10.482	4.820	-.124	-2.175	.031	-.216	-.175	-.120	.938	1.066
	login_sqrt	-.112	.212	-.031	-.527	.599	.052	-.043	-.029	.881	1.135
	GPA	17.393	2.501	.483	6.954	.000	.668	.494	.384	.633	1.579
	NJASK 5 LAL	.225	.044	.338	5.076	.000	.595	.383	.280	.687	1.456
3	(Constant)	114.371	8.859		12.910	.000					
	Gender	-2.452	2.196	-.066	-1.117	.266	.111	-.090	-.061	.871	1.148
	Free Reduced Lunch	-1.420	3.658	-.022	-.388	.699	-.100	-.032	-.021	.969	1.032
	Asian	-2.273	2.953	-.043	-.770	.443	.049	-.063	-.042	.959	1.043
	Other	-10.391	4.756	-.123	-2.185	.030	-.216	-.175	-.120	.957	1.044
	login_sqrt	-.111	.211	-.031	-.526	.600	.052	-.043	-.029	.882	1.134
	GPA	17.448	2.459	.484	7.097	.000	.668	.500	.391	.651	1.536
	NJASK 5 LAL	.225	.044	.338	5.098	.000	.595	.383	.281	.687	1.455
	(Constant)	113.928	8.760		13.005	.000					
	Gender	-2.392	2.184	-.064	-1.095	.275	.111	-.088	-.060	.875	1.143
	Asian	-2.205	2.940	-.042	-.750	.454	.049	-.061	-.041	.962	1.039
4	Other	-10.271	4.733	-.121	-2.170	.032	-.216	-.173	-.119	.962	1.040
	login_sqrt	-.109	.210	-.030	-.520	.604	.052	-.042	-.029	.882	1.133
	GPA	17.559	2.435	.487	7.211	.000	.668	.505	.396	.660	1.515
	NJASK 5 LAL	.225	.044	.338	5.106	.000	.595	.383	.280	.687	1.455
	(Constant)	113.324	8.662		13.082	.000					
	Gender	-2.089	2.100	-.056	-.995	.321	.111	-.080	-.054	.942	1.061
5	Asian	-2.010	2.909	-.038	-.691	.491	.049	-.056	-.038	.978	1.022
	Other	-10.042	4.701	-.119	-2.136	.034	-.216	-.170	-.117	.970	1.031
	GPA	17.306	2.380	.480	7.271	.000	.668	.507	.398	.688	1.454
	NJASK 5 LAL	.227	.044	.341	5.184	.000	.595	.387	.284	.693	1.443
	(Constant)	113.535	8.642		13.137	.000					
	Gender	-2.011	2.093	-.054	-.961	.338	.111	-.077	-.053	.945	1.058
6	Other	-9.786	4.678	-.116	-2.092	.038	-.216	-.166	-.114	.976	1.025
	GPA	17.159	2.367	.476	7.251	.000	.668	.504	.396	.693	1.443
	NJASK 5 LAL	.226	.044	.341	5.189	.000	.595	.386	.284	.693	1.443
7	(Constant)	114.355	8.598		13.300	.000					
	Other	-9.787	4.677	-.116	-2.093	.038	-.216	-.166	-.114	.976	1.025

GPA	16.992	2.360	.471	7.201	.000	.668	.501	.394	.697	1.435
NJASK 5 LAL	.220	.043	.331	5.103	.000	.595	.379	.279	.709	1.410

a. Dependent Variable: NJASK 6 LAL

Coefficients Table Model F-Attendance

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	5.883	.778		7.565	.000					
	Gender	.566	.611	.068	.927	.355	.078	.070	.065	.902	1.108
	Hispanic	1.512	.842	.131	1.795	.074	.211	.135	.126	.926	1.080
	Asian	-2.581	.843	-.223	-3.061	.003	-.256	-.227	-.215	.924	1.082
	Other	-.881	1.241	-.051	-.710	.479	-.052	-.054	-.050	.948	1.055
	Free Reduced Lunch	2.457	.865	.204	2.841	.005	.234	.211	.199	.950	1.052
	login_sqrt	-.072	.060	-.087	-1.194	.234	-.092	-.090	-.084	.920	1.087
2	(Constant)	5.735	.748		7.667	.000					
	Gender	.623	.605	.075	1.030	.305	.078	.078	.072	.918	1.090
	Hispanic	1.593	.834	.138	1.910	.058	.211	.143	.134	.943	1.061
	Asian	-2.490	.832	-.215	-2.992	.003	-.256	-.221	-.210	.946	1.057
	Free Reduced Lunch	2.495	.862	.208	2.894	.004	.234	.214	.203	.954	1.048
	login_sqrt	-.067	.060	-.082	-1.125	.262	-.092	-.085	-.079	.931	1.075
3	(Constant)	6.208	.591		10.511	.000					
	Hispanic	1.568	.833	.136	1.881	.062	.211	.141	.132	.943	1.060
	Asian	-2.585	.827	-.224	-3.125	.002	-.256	-.230	-.219	.958	1.044
	Free Reduced Lunch	2.362	.853	.197	2.771	.006	.234	.205	.194	.976	1.025
	login_sqrt	-.082	.058	-.099	-1.409	.161	-.092	-.106	-.099	.986	1.014
4	(Constant)	5.536	.350		15.832	.000					
	Hispanic	1.677	.832	.145	2.015	.045	.211	.150	.142	.952	1.051
	Asian	-2.481	.826	-.215	-3.003	.003	-.256	-.221	-.211	.966	1.036

Free Reduced Lunch	2.349	.855	.195	2.748	.007	.234	.203	.193	.976	1.025

a. Dependent Variable: Attendance

Appendix C

Survey Letter to Parents and Questions

May 5, 2014

Dear Parent/Guardian,

My name is Shannon Dries Hopkins and I am currently a doctoral candidate at Seton Hall University's Department of Education and Human Services. I am also the K-12 Director of Guidance for the Rutherford School District.

I am currently conducting a research study to determine a link, if any, between the use of an Electronic Grade Book, which in our case is Parent Portal found through PowerSchool, and student achievement, attendance, and parental involvement. I will extract information regarding NJ ASK

scores, grades, attendance records, and parent logins. In addition to these data, I am also asking parents and/or guardians to complete a descriptive survey regarding their experiences with Parent Portal.

This survey should take no longer than 5-10 minutes and contains 27 questions.

Please click on the link below to complete the survey entitled *Parent Portal Questionnaire.* Questions 1-20 ask about your experiences with Parent Portal over the last year. Questions 21-27 ask you to provide some demographic information.

Your participation in this study through your completion of this survey is completely voluntary and much appreciated. Please be sure only one member per household completes the survey.

There will be no identifying data used by the researcher or any other persons for the questionnaire or for the data that will be extracted regarding test scores, attendance rates, or Parent Portal log-ins. Data extracted regarding test scores, attendance rates, and Parent Portal logins will be anonymous. Each data set or student will be assigned a number and all identifying characteristics such as name, date of birth, address, etc. will be eliminated.

All data will be stored on a USB memory key and kept in a locked drawer in order to maintain confidentiality.

Thank you for taking the time to read this letter and to complete the survey at the link below.

https://www.surveymonkey.com/s/ParentPortalQuestionnaire

Regards,
Shannon Dries Hopkins
Director Of Guidance
Rutherford Public Schools